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ILLUSTRATIONS.

Design for a Town Church (Soane Medallion, Royal Institute of British Architects, 1903):—
Perspective View
Section
Details
By Mr. E. F. Reynolds.

Blocks in Text.

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School Buildings and the Education Act.

AT the present moment nearly all Local Authorities are interested in the new Education Act. For a long time there has not been so important a movement as the transfer of the elementary schools throughout the country to the Local Authorities, usually a Town Council or a County Council. With the general question we are not concerned, either in regard to the transfer of existing schools or to their future management. It may, however, be desirable to say something upon the question of the school buildings, which is one of the most important, and, in some respects, difficult points with which the new Local Authorities will have to deal.

So far as regards the Board schools, which must now be called by their new title of "provided schools," the matter is simple. The buildings of these schools and the teachers' houses are handed over, bag and baggage, to the new Authorities, and they will have to be kept in repair or enlarged out of the rates. When, however, we come to the existing Voluntary schools, or, to give them their new name, "non-provided schools," the matter is by no means so simple, except where the managers lease their buildings under the Act of 1870 to the Local Authority, when the latter will, if the lease is properly drawn, of course be liable for all repairs. In regard to these schools in the future the secular instruction is wholly under the jurisdiction of the Local Authority, either a Town Council or a County Council; but, by Section 7, Sub-Section D, of the Education Act, the managers are to provide the school-house free of any charge, except for the teacher's dwelling-house (if any); and they must, out of funds provided by them, keep the schoolhouse in good repair and make such alterations and improvements in the building as may be reasonably required by the Local Education Authority. Then follows this proviso: That such damage as the Local Authority consider to be due to fair wear and tear in the use of any room in the schoolhouse for the purpose of a public elementary school shall be made good by the Authority. It is obvious that this section is one which is likely to cause considerable difference of opinion, and it is equally certain that the burdens which the managers will have to bear in regard to buildings will vary very much according to the disposition of their County or Town Council and to the individual views of the Surveyor of the Authority. But even the most good-natured and conservative Councils are likely to be hard taskmasters. The general check upon Local Authorities is the fear of the ratepayer, but in the case of the buildings of the non-provided schools this will not exist, and by far the easiest way in which the Local Authorities can show their educational zeal will be by causing the managers of non-provided schools to keep them in first-class condition, and to enlarge them whenever there is the slightest necessity. Because, as has already been pointed out, the managers must—the exact word is "shall" in the section, which, under the circumstances, is legally equivalent to "must"—keep the schoolhouse in good repair. Further than that, they have, as we have said, to make such alterations and improvements as may reasonably be required by the Education Authority. Should there be any difference of opinion as to the reasonableness of the requirement, it shall be determined by the Board of Education; in other words, by the supreme authority, whose great object will certainly be to improve elementary education. A result of an appeal, therefore, to the Board of Education in regard to buildings is almost certain to be in favour of the Education Authority, unless its requirements are ridiculously exaggerated.

An even more difficult question will be the application of the proviso which we have already quoted as to fair wear and tear. This is a phrase which is somewhat novel in connexion with buildings, and is not very easy of construction in regard to schools. From the context the words do not appear to include all internal repairs, otherwise Parliament would, we should suppose, have made the Local Authority liable for the *repair* of the schoolroom. The Legislature, on the contrary, appears to have considered that there was some special damage received by a room when used as a schoolroom, since we have in connexion the several words, "wear and tear," "use of any room," and "for purpose of a school." If, therefore, the future managers of a non-provided school are under the impression that ordinary repairs will be paid for by the Local Authority, it is by no means certain that they are not under a delusion. Wear and tear of a schoolroom may in fact be regarded as something equivalent to extraordinary traffic on a highway. In other words, it is rather damage than mere usage of a room in the ordinary sense for which the Education Authority will be liable. For example, if we take the periods at which rooms should be painted internally as every seven years, and if, owing to the use of a room as a schoolroom, the lower part of it required painting in three years, then we take it that the Local Authority would be liable to pay for the painting of half the room at the end of the third year, or of the whole of the room if half of the room alone could not be painted. But if at the end of four years more—that is, at the end of seven years from the time when the Local Authority began to use the school—a room had to be painted, the expense of this would have to be borne by the managers, because, in the normal course of things, the room, even if it had not been a schoolroom, would have required painting at the end of this period. This is only one example, but our readers who are technically interested in buildings can imagine many more for themselves. Probably the simplest way of settling all disputes would be for the Local Authority and for the schools, or some body representing them, to agree upon one person for every county or town who should decide all the questions that may arise between them in regard to the repair of buildings.

Another point, though less important, should be noted—namely, that the Education Authority is, under the Act, entitled to use any school furniture and apparatus belonging to the managers of a non-provided school. Nothing is said as to the persons by whom the repairs are to be made, and it is not clear, having regard to the fact that the Local Education Authority is only to use and not to become owner of the existing school furniture, that the managers will not have to repair it so long as it is capable of

being available for use. But new equipment will be paid for by the ratepayers, not by the managers.

THE ARTS AND CRAFTS EXHIBITION.—III.

JEWELLERY and decorative work in metal, silver more especially, has shown a good deal of new life in this country during the last few years, though none of this vitalising influence has as yet penetrated to the fashionable jewellers' shops, where one still sees only commonplaces or worse; it must be looked for in the work of individual artists who do not work for the shops, but for their own clients and purchasers. An occasional exhibition of the works of special artists has been seen in London; but the Arts and Crafts Exhibition affords the best opportunity for its display on a large scale; and in the present exhibition this class of artistic work is largely represented.

The possible forms of jewellery design would seem to be practically almost infinite, especially when with gold and silver are combined the colour and flash of precious stones and the more varied colour to be obtained from enamel; yet one is conscious of a certain effort, in designs exhibited at the Arts and Crafts, after novelty for the sake of novelty—an effort sometimes but not always successful; and the exhibition can show some jewellery which is rather more curious than beautiful. In articles of use, too, in silver work, use seems to be sometimes overlooked in the desire for an unusual form, as in the silver soup tureen in Case 490 in the central hall. This has a high and narrow bowl, coming to a point at the bottom—a bad shape for getting the ladle into; it stands far too high for convenience in use, and the support, a series of perforated conventional trees, is too light and too unstructural. The proper shape for a soup tureen is much better shown in the example in Case 491, by the Keswick School of Industrial Arts.

The most important and interesting work in silver is the Triptych by Mr. and Mrs. Dawson (419), in the middle of the floor in the North Gallery. This is a purely artistic conception; an effort to use silversmith's work to illustrate an abstract idea. It stands some 20 in. high; a centre with folding doors supported between boldly modelled uprights showing very free treatment of the metal in scroll forms. The whole work illustrates "sleep" or "repose." On the outer sides of the folding doors are enamel panels representing poppies, beautiful in rich colour. On opening the doors, the inside of one has an enamel picture showing a young man resting on the hedge from ploughing, the other door an old man seated beside a cottage; the centre space shows a mediæval port or harbour with a mediæval ship entering it. Beneath this are the lines from the "Faërie Queene" which give the key to the whole—

"Rest after toil, port after stormy seas,
Ease after war, death after life, doth greatly please."

Above is a winged head with the inscription ΥΠΝΟΣ. All the details of the silver work are more or less symbolic, and at the same time add to the decorative effect. This is really a poem in silver and enamel, and a very beautiful and remarkable work, both in conception and execution.

Something of the same kind is aimed at in some of the work exhibited in the West Gallery by Mr. Alexander Fisher and assistants, but hardly with the same success. The Triptych overmantel in bronze, silver, and gold, "The Court of Love," is too architectural in its forms for metal work, and the forms are those of a rather commonplace modern Gothic. On the same stand the chalice in silver repoussé, enamel, amber, and precious stones (*c*) is an example of the "new art" style of design for this kind of work, in which the stalk ramifies out into half-naturalistic branch-work, ragged and uncertain in line, giving a rich effect as a whole, but not clean or certain in detail. The same kind of work reappears in the large jewel-box on the neighbouring stand, by the same artist. It is bad style, and its vogue will not last long. Compare this with such a thing as the silver cup by Countess Gleichen (*k* in Case 165), and see how superior in style is this clean-lined symmetrical cup with its Greek-like handles, and the bas-relief frieze on the bowl of the cup. Mr. Fisher's "Mirror in Bronze Silvered" is a remarkable bit of work which looks as if it had come from a Renaissance atelier, both in its exuberance and in its faults of design; it is a hand mirror in which the handle is formed by a nude Venus, whose hair flies up as if blowing in the wind; and the mirror, in the form of a shell, is supported by these windy locks of hair. This is just what a Renaissance artist might have done, and it is an excellent piece of work in its way; but structurally the connexion between mirror and handle is very bad, and the nude figure is degraded by being used as a handle, in spite of ancient precedent.

The value of pure and well-designed form in silver is illustrated in the silver chalice set with carbuncles, letter *l* in Case 490 (the same case which contains the soup tureen we objected to); this, designed by Mr. W. A. White, and executed by members of the Guild of Handicraft, is a really artistic bit of work; so is the silver and enamel compote bowl (*d*) by the same designer and executants. And in Case 165 in the West Gallery may be found two beautiful silver buckles by Mrs. Bethune, each consisting of two little figures in alto-relief; the one marked *i* is the best, inasmuch as the figures are playfully treated; those in the other buckle (*g*), which seem to be founded on a Greek grave-relief, are a little too serious, even pathetic, for their position. The playful use of the figure in objects of everyday utility is well enough; its more serious use in such positions rather jars on one's sense of the fitness of things. One charming example of the playful use of the figure is to be found in Miss Read's "Silver Salt-cellar" (*j* in Case 180), which has a shallow glass bowl to which a silver mermaid is attached, her tail underneath, her figure bowed forward with hands extended over the salt—probably in allusion to the salt sea; at all events, it is a very pretty bit of fanciful design.

The exhibits representing jewellery and personal ornament consist largely of necklaces, a class of article which offers perhaps more scope for effect than any other kind of adornment; and the majority of these consist of a combination of gold or silver chains with precious stones or enamel. The latter material, which affords the opportunity both for colour and symbolic design, is now becoming very largely used in personal ornament. Some rather original examples of the use of enamel are shown among the things in 163 made by members of the Guild of Handicraft; little oblong upright enamel pictures with a finish of gold filigree on the upper side, partly for attachment, but which also adds a point to the design. There are some things among the jewellery which ought hardly to have been in this exhibition; a pin with a great realistic-looking insect of some kind at the top of it; a wreath with rubies in naturalistic imitation of a rose spray, &c.; and the lady who would venture to wear the "necklace with pearl blisters and topazes," *e* in Case 163, would be a bold person, and would probably be thought so. But most of the work shown is in the best taste, and some of it of great beauty. Of imitations of artificial objects, which are the bane of the ordinary commercial jewellery, there is, as may be supposed, little or nothing. Where gold chains are used as part of a necklace, we like them to be as delicate and fine as possible; silver may be used in more massive proportions; but gold chains should express both the value and the ductility of the metal by their delicate proportions. This is well illustrated in some of the Guild of Handicraft work in Case 163; the muff chain, for instance, letter *c*, with the gold cunningly and delicately twisted; the gold necklace set with opals (*o*), and the neck-chain (*k*), with enamel work and pearls, the pearls prettily enshrined in cages of twisted silver. Here and there we come on new fancies such as this; but generally there is not very marked originality in the ornament exhibits; they resolve themselves into the more or less decorative combination of chains and precious stones. Some of the best and most refined work is to be found in Case 169, exhibited by Mr. and Mrs. Arthur Gaskin; the necklaces lettered *n* and *p*, and the enamel pendant *ii*, are especially worth notice.

Book-binding and printing are represented in the South Gallery, in a good many examples. Nearly all the book-bindings are good, though there may not be many that are especially original or striking. This is perhaps in one respect a merit. It does not do to attempt to make bindings too symbolic or to put too much meaning into them; this is making the outside of the book compete with the contents, whereas it should be subordinate to them; the exterior should have a decorative appearance, but not strive to compel attention away from the literary contents, for which it is only a cover and protection. Among the best bindings shown are Mr. Douglass Cockerell's "Shakespeare's Poems" (331 *d*), a green pigskin with very rich floral ornament in gold tooling of a close pattern, covering the whole surface. This illustrates one method of effect, richness of decorative treatment. The same designer's "In Memoriam" illustrates an opposite method, plain panelling with a single ornamental feature consisting of the initials "A. H. H." in a wreath, both appropriate and pleasing in effect. We do not see any advantage in the use of bare wooden "boards" in the large copy of Plutarch (*f*). Morris's "Lectures" (332 *b*), bound by Miss Katherine Adams, has a good design of a foliage border surrounding an upright title-panel. The large volume of "The Church Towers of Somerset" (338 *j*), bound by Miss Philpott, is treated in a special manner which suits the idea of an architectural book, giving a certain architectural style to the binding; and in the same case is a good

binding (*p*) by the Camberwell School of Arts and Crafts, in a pattern which forms alternating squares of enriched and nearly plain surface. There is some very fine typography to be seen in the open books which form special illustrations of printing; especially the "Paradise Lost" by Mr. Cobden Sanderson (with the original spelling restored—"whose mortal tast," &c.), and in the same exhibitor's "Ideal book or Book Beautiful," which in typography and the arrangement of the page merits its title. The system of giving the names of all concerned in the work is carried to rather an absurd extent; the compositor's and pressmen's names are given; the man who designed the title, the man who wrote it out for the engraver, and the engraver. Why not add the man who cast the type and the man who mixed the ink?

In taking leave of the Arts and Crafts we may congratulate the Society on an exhibition which is perhaps of more varied interest than any which they have held, though some former exhibitions may have shown individual works superior to any in this one.

NOTES.

The Names of the New Streets.

THOUGH we very much wished to see the new street from Holborn to the Strand called "Gordon Avenue," in memory of the noblest Englishman of his day, we think the London County Council may be congratulated on their choice of names. "Kingsway" is brief and appropriate, and has a fine and stately ring about it; and "Aldwych," which is said to have been the suggestion of Mr. Gomme, the Clerk of the Council, has the merit of historic significance. In future, however, we should like to see more of the system so largely adopted in Paris, of commemorating eminent men in the naming of streets.

The Traffic and Communications of the Metropolis.

WE confess that we become more and more sceptical of any practical results from the appointment of Royal Commissions. There is something positively melancholy in seeing a number of able men make careful investigations and an elaborate Report which is so much waste-paper unless there is some kind of political or popular pressure to cause it to become a basis for legislation. For this reason we do not anticipate much result from the Royal Commission which has just been appointed to inquire into the question of the traffic and communications of the Metropolis. Take, for example, the question of communication between the different railway termini. Each of these is in the hands of a private company, and however desirable it may be that there should be a systematic connexion between the different railway stations of London, it requires the consent of a number of separate and independent bodies, not only the railway companies, but the different Local Authorities. We trust, at any rate, that the Commission will recommend the handing over of the streets of the Metropolis to the London County Council. It is only by having one central body to manage the streets of London that there can ever be satisfactory management. In many respects the increasing of the importance of the districts of London and the making of them into boroughs was a retrograde step from the point of view of the systematic treatment of the communications of London.

Safety on Railways in England and America.

IT is stated that the Directors of the London and North-Western Railway Company have decided to send a Committee to the United States to investigate American methods of railway management, and it is satisfactory to see that our large companies are not too insular to be willing to learn something from the working of other systems; but in this connexion the figures given by the chairman of the London and South-Western Railway Company at the half-yearly meeting will be read with especial interest. From this statement it appears that although in the United States the railway line mileage exceeds that of Great Britain by about nine times, in our country nearly eighteen passengers per mile are carried to one in the United States. In 1901 the Chairman stated that whilst not one passenger was killed in Great Britain, 249 deaths were caused in the United States, the corresponding figures as to those injured being 476 on British railways to 4,128 in America. If the respective number of passengers carried is considered this disproportion is very great, and, having regard to the congestion of traffic which exists near the Metropolis and the unfavourable conditions of climate under which, for some portion of the year, the traffic has to be maintained, this speaks highly for the management of our railway companies in this respect. Our own belief is that in regard to the safety of passengers American railway management may almost be called reckless, in comparison with English. In a book on American railways written some years ago by American engineers, it was frankly stated that no insurance company would take the lives of the officials in the travelling post-office vans; and in the same publication it was maintained, with the most cynical candour, that it was foolish to risk capital in constructing a new railway on the best methods until it was seen whether it would have a remunerative traffic—it should be run up in the cheapest manner first, as an experiment; and the fatuity of English companies in spending money on the best construction in new branch lines was ridiculed!

Gas in North London.

CONSUMERS of gas in the very extensive area north of the Thames supplied by the Gas Light and Coke Co. will welcome the revolt of a section of the Company's shareholders at the recent half-yearly meeting against its Court of Directors, if it results in an improvement in the business methods adopted by the Company. The London County Council, recognising that cheap gas of low candle-power is more valuable to the consumer than costly gas of high illuminating power, has promoted a Bill to reduce the standard illuminating power of the Company's gas from 16 to 14 candles, and the standard price by 2d. per 1,000 cubic feet, in addition to a further reduction as recommended by Sir James Rankin's Committee. The Gas Light Co., on the plea that it cannot afford to make this reduction, has decided to oppose this Bill, in spite of the fact that the South Metropolitan Co. and the Commercial Co. have already voluntarily made similar reductions. It is gratifying to note that Sir George Livesey, who is one of the Company's shareholders and at the same time one of the most eminent authorities on gas supply, spoke favourably of the London County Council Bill and unfavourably of that promoted by the Company. It is difficult to understand the opposition of the Company to the proposal to reduce the standard illuminating power by 2 candles with a corresponding reduction of 2d. in the standard price, except on the supposition that the Company hopes by opposition to effect a better bargain—an altogether forlorn hope in view of the voluntary reductions made by the other Metropolitan Companies.

Tyburn and Rebuilding in Edgware-road.

A SITE has been cleared by the pulling down of some houses at the southern end, on the east side, of Edgware-road, for the erection, at a cost of 7,000*l.*, of new headquarters for the Church Army, to comprise the administrative offices and a clubroom and refreshment-bar, in connexion with the men's training-home at the rear of the new premises. One of the old houses, No. 12, had retained the ironwork balconies or verandahs on its first and second floors which it is said were built to accommodate the sheriffs and other officials who were required to attend the execution of sentence upon criminals at Tyburn. The gallows were kept in that house. Timbs writes that when they were no longer used there (that is, after November, 1783) the gallows were sawn into pieces and made into stands for beer-casks in the cellars of the adjacent Carpenters' Arms public-house, rebuilt, as the New Inn in 1875. The exact position of the gallows is still a controverted question, due most probably to the circumstance that they were not always erected on the same spot at that, the later, Tyburn. The most trustworthy authorities aver that in more recent times they stood a few yards distant, southwards, from the corner of Edgware-road and Bryanston-street, opposite the site we indicate. Another account says that a lease of No. 49, Connaught-square cites that house as standing on the spot. In his "History of Marylebone," Smith records that the gibbet stood during many years on a mound at the corner of Edgware-road, near the turnpike, on the spot since occupied by the toolhouse of the Uxbridge-road Trust. The removal of Tyburn Gate in 1829 is commemorated by the inscription on an iron tablet set against the Park railings opposite the end of Edgware-road. Messrs. Hudson & Hunt have been appointed architects of the new buildings for the Church Army.

The Renovation of the Sheldonian Theatre.

THE Report of the Curators of the Sheldonian Theatre, Oxford, on the restoration of the ceiling pictures, contains food for thought and some humorous ideas. It appears that the damage to these pictures has been caused by the cupola, which was erected early in the last century, having been leaky; but the Curators with some satisfaction announce that this defect has been practically overcome, and that it is now watertight, "unless in exceptionally violent storms." The further statement that this has been effected at a cost of nearly 180*l.*, however, makes it a matter of surprise that this work was not accomplished some eighty

years ago. Another cause of the damage was traced to the fact that workmen had found the back of the pictures a convenient depository for "shavings, sawdust, old nails, and other rubbish," and, moreover, had placed some of the paint intended for the cornices and walls on the pictures. The Report of Mr. R. J. Nairn discloses the painful fact that the cornice which appears to support the ceiling is really a sham, being constructed only of deal painted to represent granite, and itself supported by iron rods from the timbers above. It would therefore appear that if Oxford moves slowly in the matter of renovation, it led the times in jerry-building.

Mr. Davidson's Water-colours.

AT Messrs. Dowdeswell's galleries is to be seen a pretty large and representative collection of the landscapes of the late Mr. Charles Davidson, an old member of the Society of Painters in Water Colours. They are not all of equal value, some of them, such as the large one of the Lledyr Valley (47), savouring rather of conventional "picture-making," but there are others of more characteristic interest. The first one on the catalogue, "At the Mumbles, Swansea," with the boats casting strong shadows on the shingle, is a very true piece of work. Among others that may be mentioned as of special excellence are "Autumn—near Reigate" (7), with the sunlight on the foreground; "A Sussex Common" (14); "On the Hills above Bettws-y-Coed" (18); "Approaching Storm, Dartmoor" (24); "On the Moor" (43), a fine composition out of very simple materials; and the small drawing, "Cornfield, Streatley-on-Thames" (49), one of the very best, showing merely a cornfield on a steep slope or curve with a belt of trees making a higher curve above, one of those little bits of effective composition which often are of more real artistic value than larger and more elaborate works.

Society of Fine Arts.

AT the Society of Fine Arts is a collection of water-colour drawings by Mr. E. Wake Cook, exhibited under the title "The Quest of Beauty (real and ideal)." A large proportion of these are drawings of architectural subjects, many of them from Venice, partly prompted by the feeling, as expressed in the artist's introductory note to the catalogue, that Venetian architecture is getting into so precarious a condition owing to the effects both of time and of changes made by the hand of man, that it is a duty on the part of artists to do all they can to at least preserve faithful records of buildings which may soon pass away. "It would be an artistic calamity if this "Sea Cybele" should crumble to a memory, leaving nothing standing but modern counterfeits of her past glories, up-to-date shipyards, factories, and hotels." Every one will sympathise with this feeling; and Mr. Cook has done his task well in respect of this portion of his work. His architectural studies are very careful, very highly finished, and in every way admirable. We may mention especially "Porta della Carta" (1); "Browning's Palace," the Rezzonico (4); and "The Loggetta" (60), recently destroyed in the fall of the Campanile—a drawing of special value in every sense. There is a very large drawing of the Campanile itself (58), also of special value now, though perhaps a little deficient in power; delicacy in dealing with small and highly-wrought architectural detail is Mr. Cook's strong point. A study of "Marble Pavement in the Forum, Rome" (48) is also very interesting. Among the landscapes, the best is a beautiful little drawing of a view "Near Arthog, Barmouth" (27). The "ideal" is represented by some imaginary scenes of temples and trees, with nude figures, somewhat after the feeling of one class of Turner's works. There is a good deal of beauty in these, though to be entirely successful in such imaginary creations demands the hand of a great artist. It is in the representations of ancient architecture that the strength of the collection lies, and this should recommend it to the attention of our readers.

MAGAZINES AND REVIEWS.

THE *Art Journal* opens with an article on "Albert Moore: an Appreciation," by Mr. A. L. Baldry. We think he exaggerates Albert Moore very much. That Moore deliberately set aside the mere "subject picture" as an inferior form of art is intelligible enough, and he was right enough in regard to the highest purposes of art, although there is a great deal more to be said for the subject picture, in its best form, than some of the "pure art" critics quite realise. But if Moore "conceived and practised what he believed to be the noblest form of pictorial art," one can only regret that his ideas as to the noblest form of art were so very inadequate. His pictures represent simply physical beauty devoid of intellectual meaning; very charming to the eye in all cases, but in most cases presenting nothing to the mind. The "Quartet" is a happy exception; it has a fine symbolical meaning in addition to its charming decorative effect; but it is in this sense very exceptional among his works. His graceful young women, draped and undraped, are for the most part creatures absolutely without expression or any evidence of soul—merely beautiful lay figures; and if that is supposed to be "the noblest form of art," so much the worse for art. A short article is devoted to the pottery work of Mr. W. Moorcroft, a head of a pottery firm at Burslem, who has aimed at striking out a special character in the work produced under his direction. In the illustrations given it is difficult to judge from black and white only of what must depend very much on colour treatment. They are described as "characterised by a particular hue of colour which may be described as a pale celadon with deep mazarine blue enrichments, while yellow and green are sparingly introduced." In other respects the special character of this pottery seems to consist in a rather free use of floral ornament without interfering with general grace and symmetry of line in the whole object. An article on Sir E. Waterlow's landscapes is another contribution to the number.

The *Contemporary Review* has an interesting article by the Rev. John M. Bacon on "The Mechanism of the Air," based on observations of cross currents of air made during various balloon ascents; not only horizontal but up and down currents, the behaviour of which seems often to be very curious and unexpected. This the writer observes, is a vital factor in the ventilation of cities:—

> "That the ascending currents of the atmosphere carry up quantities of dust and impalpable matter which they leave floating in the upper levels till washed down by rain, is a patent fact. But it requires a visit to the regions far up, and an analysis of the air there met with, to learn that a veritable dust ocean lies over towns, often of great depth, yet always having a definite limit above which it is possible to climb and then to find oneself in a pure sky of extraordinary transparency and deepest blue."

And he implies that the vertical currents of the atmosphere furnish inter-communication between these pure-air spaces and the inhabitant of the town:—

> "The vast engine of the atmosphere which we have been regarding drives its machinery up to his very door. Give it only fair play and its invisible turbines will be at work, whirling out to the aërial sea the tainted air and disease germs about him, and bringing down on him the health-giving air from the pure deeps."

But what is "giving it fair play"? This is a question rather briefly disposed of by he writer in a concluding sentence in which the recommends "the cutting away of all overhanging trees and creepers, the maintaining of constant draught through chimneys and ventilators, and (happily a growing habit) the keeping open of windows through the night."

The *Magazine of Art* contains the commencement of a new experiment—an attempt to teach perspective by a painter (Mr. W. L. Wyllie) in a common-sense manner and without geometrical diagrams. It may be doubted whether this method would be quite equal to the teaching of architectural perspective, though even in regard to this we have always been of opinion that the majority of perspective text-books puzzle the learner with a number of quite unnecessary complications of diagrams. In ordinary picture work perspective is a simpler matter, and only needs that certain leading facts should be grasped and retained in the mind. Mr. Wyllie shows very clearly, by sketches, the relation of figures and other objects in a landscape to the horizon and to the spectator's position, and he is quite clear as to what the horizon *is*, a point on which there is a good deal of confusion in the minds of many people. He also draws attention to a point which is often practically overlooked—viz., that shadows are, practically, parallel, and therefore converge like all other parallel lines. How often we see a sketch in which all the shadows are at the same angle on the paper, without reference to the point of sight. The articles, of which this is the first of a series, are entitled "Nature's Laws and the Making of Pictures"; perhaps a better title than "Perspective," which to the mind of the average reader at once suggests diagrams. Mr. Wyllie is no doubt quite right in saying that many even of painters have very uncertain notions about perspective; in fact, we have found painters hopeless over a problem of perspective which to an architect would seem an exceedingly simple one. The same issue includes an article on Indian art at Delhi, and one on "British Arts and Crafts in 1903," in relation of course to the Arts and Crafts Exhibition; but we doubt whether the scope of that exhibition is wide enough for it to be called British. The writer of the article, Mr. Vallance, indeed half suggests that the Arts and Crafts Society, having shown the way (assuming that they have done so) had better close, as it is only affording opportunity for base imitations of some of the characteristics of its exhibits. To our thinking many of the exhibits themselves are far from being sane and good art; we prefer the continuance of the exhibition, but we wish it would strive after a wider basis and less of mere peculiarity under the pretence of originality.

The *Monthly Review* contains a most picturesquely written article, signed by Evelyn March Phillipps, on the Villa d'Este at Tivoli, its history and recollections, accompanied by some illustrations from photographs.

The *Architektonische Rundschau* publishes as its principal article an illustrated essay by Herr Von Schwindrazheim on "National Art in Schleswig-Holstein," which deals really, however, with national or popular architecture. The illustrations given of some of the street houses and country houses and cottages are very interesting; the town houses perhaps the most so, especially the fronts of two old houses on Friedrichstadt and that of a very old house in the High-street of Husum. Among the separate plates those which will most appeal to English architects are the two simplest; a design for working-class cottages, by MM. Otte and Wipperling of Berlin, an irregular terrace of small houses shown in two very pretty chromo-lithograph prints of front and rear elevations; and a sketch for a country house, almost in outline, by Herr Kronenberger of Munich. The more important plates illustrate, among other things, a Kaufhaus in Berlin, by Herr Jatzow of that city, the front of which is a mass of windows divided up by narrow stone piers running the whole height of the front and finishing at the top in a kind of capital; the details are all clever with that kind of modern German cleverness which gives one a shudder. A large villa in the outskirts of Stuttgart, with rough-dressed stonework in the basement, ashlar above, and half-timber above that, is more pleasing than many German country houses;

Herr Eitel of Stuttgart is the architect. The number contains an illustration also of one of MM. Fellner & Helmer's numerous theatres, that at Graz—a piece of respectable classic in their ordinary theatre style.

In the *Berliner Architekturwelt* the Art and Music Academy at Charlottenburg, by MM. Kayser and von Groszheim of Berlin, is a fine and effective building in general grouping, in Free Classic style and without the eccentricity of detail so often prevalent in modern German Classic architecture. The plan is only given *en bloc*, showing a front block with a large quadrangle and garden in the rear. Among the other illustrations is an "Idea" for a great gymnasium or body-training school, by Herr Werle, which shows a very bold architectural conception with rather extravagant details, and an interior of an immense monumental vaulted swimming-bath. The whole thing is a kind of architectural dream (the Germans are great in this kind of thing), but not without interest.

The *Antiquary* contains an article, with illustrations, on a fine seventeenth-century silver-mounted sword recently found in Hull. It was found in the roof of an old house in High-street, and bears the date 1658. Mr. Charles Dawson writes on "A New Classification of Sussex Pottery," in reference to a loan collection which he has brought together and which is now on view in the lower room of the Gate-house at Lewes Castle, and which is stated to afford the means of establishing old Sussex pottery as a distinct class of ceramics. The collection will shortly be dispersed, and therefore those who are interested in the subject should lose no time in seeing it.

The *World's Work*, a new publication, has an interesting article on "What the British Unionists Saw" in workshops in the United States. The thing that seems to have struck them most was the extent to which machinery did the work done by men in England. "American industry is great because men sit in chairs moving levers, and massive devils do mighty tasks at their bidding"; a curious contrast to the old "down with machinery" cry in times which can still be remembered in England. The whole article is very suggestive for those who are interested in American manufacture *versus* English. The same number contains an illustrated article on "Office Buildings in Steel and Stone"—American high buildings to wit; there is nothing new in it, however.

Temple Bar contains a long article "On Some Old Oriental," meaning china, signed "X. T. B." It is not only interesting, but embodies, in one way or another, a good deal of information on the subject.

Knowledge presents us with an architectural article, on St. Sophia, by Mr. Antoniadi, consisting of some notes on the principal facts in the history of the building, along with a restored view of the interior as it may have appeared just after completion, showing, among other things, the crowd of lamps suspended over the floor which raised such enthusiasm among contemporary witnesses. Mr. A. Fowler, F.R.A.S. contributes the first of a series of articles on "The Chemistry of the Stars."

The *Gentleman's Magazine* contains a short article by Mr. A. Francis Steuart on "The Saracens in Sicily," which, though not professedly architectural, deals with a subject that is connected with architectural developments in Sicily.

In *Scribner*, under "The Field of Art," Mr. H. R. Marshall discusses the question "Shall artists be trained in our Universities?"—a subject on which it appears that there is a good deal of debate in the States at present. He sums up in favour of it, as tending to give the artist larger and broader ideas on the intellectual basis of art. Many artists clever in technique are no doubt wanting in intellectual perception, as the walls of the Royal Academy annually testify; but would University training improve them? and would it not stand in the way of that mastery of technique which must be trained for when young, and for which nothing can compensate? The same number contains an article on "Picturesque Milan," by Miss Edith Wharton, with some charming illustrations by Mr. Peixotto.

Harper contains a popular article, illustrated, on the Roman wall, under the title, "The Edge of an Empire," by Mr. E. Lester Arnold, which may serve to induce some people to go and look at a celebrated antiquity which all have heard of and few have taken the trouble to see. The writer's opening sentence on this head is worth quoting:—

"The kindly schoolmaster, conducting a youthful intelligence on a tour through ancient history, sometimes points out that the Roman Emperor Hadrian, when vexed by northern barbarians, built a wall across England from Tyne to Solway. His maps indorse the fact, and youthful fingers trace the thin black line indicating its course over hill and valley with mild wonder; but there, for scholar and pupil alike, the matter generally ends. Yet that wall still stands to-day, forgotten of tourists, bitterly despoiled by generations of shepherd builders, but nevertheless much as it was when English history was but in the beginning—the very front and buckler of a bygone empire, eloquent in each yard of its seventy miles, the greatest, the most neglected, the least valued of our national antiquities!"

What is coming to our great quarterlies, once the strongholds of anonymous criticism? Here is the *Quarterly* with three signed articles in it; "South American Animals and their Origin" by R. Lyddeker; "A Conspectus of Science," by Sir Michael Foster; and "The Early Art of the Netherlands" by Julia Ady. We should be sorry if the *Quarterly* joined the ranks of the personally written magazines, in which articles are read (and too often published) because of the writer's signature and not because of the contents. The advantage of the anonymous review is that it leads the reader to estimate an article by its inherent power, not by the authority of a name, and to take the trouble of forming a judgment of it for himself. Sir Michael Foster's rather dry article is a review of certain catalogues of scientific literature. Miss (or Mrs.) Ady's article is, like several other recent essays, inspired by the Bruges exhibition, which has directed so much attention to the early Flemish painters. The writer seems well acquainted with her subject. She suggests an explanation of the peculiarly realistic tendencies of the Flemish painters. They did not paint, like the Italian masters, for the church and the people; they painted for the wealthy burghers of Bruges and Ghent, Brussels and Louvain, a cultivated and somewhat materialistic class; "accordingly they strove to reproduce the sheen of silk, the gloss of velvet, and the sparkle of jewels, with minute care and accuracy, working slowly and surely, on a comparatively small scale, and bestowing infinite pains on every part of the picture, they succeeded in attaining a degree of finish and brilliancy which has never been surpassed." And after all, perfect execution seems to be what retains its hold longest in art. Intellectual ideals may change, but the mastery over technique will always keep its place. The same number contains also an important article on "The Port of London," being a review of the Report of the Royal Commission on the subject, the conclusions and recommendations of which the article for the most part supports.

The *International Quarterly* is the title of a new quarterly magazine edited by Mr. F. A. Richardson, which seems to aim at a very wide range; and though all the articles are in English, we presume from the polyglot nature of the list of authors that some of them are written in other languages and translated into English. Among the articles which are on subjects of interest to our readers is one on "The American Workman and the French," written by M. Jules Seigfried, Member of the French Chamber of Deputies, in which a parallel, or contrast, is drawn between the condition and character of the French and the American workman. The difference in the scale of wages between the two, which is tabulated for various trades, is very remarkable, though against it must be set the fact that lodging, or house room, is much more expensive in the States. The following passage is significant:—

"It is known and believed in America that intelligent zeal is sure to be rewarded, either by a promotion sometimes rapid and even astounding, or by a premium received immediately. We have noticed the importance of invention in the business development of America. The workman plays a great part in this search for the new. Numerous inventions have been made by workmen who knew the practical handling of their machine, and the direction in which its perfecting might be sought. Did these American workmen do this for the love of art? Who knows? Perhaps to some extent they did, for I believe that the workman of the New World possesses proper pride and a disinterested spirit. But he also knows well that every invention which will be a source of profit to his employer will also raise him, and that he will not be forgotten. When thousands are seeking, the chances are that some one will find, and this is the reason, I think, why so much is found out in America."

The *International* also contains a good article by Mr. Russell Sturgis, professedly on "Recent American Architecture," but which in reality includes a good deal of criticism bearing on art and architecture generally, independent of country.

The *Nineteenth Century* contains an article by Mr. E. B. Havell, the Principal of the Government School of Art at Calcutta, on "British Philistinism and Indian Art," which should be read by our rulers, if they have grace to profit by it; our readers will readily guess what is the main argument of such an essay; but the argument has rarely been better and more forcibly put. The writer says, with absolute truth, that in England art is now regarded as a mere toy for the rich, which they may have or may not, according as they want it; in India, where there are no native schools of art, "art lives and is felt as much by the ryot as by the maharajah." Yet this native art we are doing our best to poison out of existence by a system of South-Kensingtonising. It is satisfactory, at all events, that the present Viceroy of India seems to be conscious of the mistake, and may be able to do something to rectify it. An article on "A Working Man's View of Trade-Unions," by Mr. Jas. G. Hutchinson, contains a great deal of good sense and wise suggestion. One point to which he specially draws attention is that the supposed qualifications for a man to become a member of a trade-union are far too easily accepted as existing, in the desire to make recruits; and that membership of a union thus by no means carries with it the proof of a high standard of efficiency. There are other suggestions in the article which managers of trade-unions would do well to consider.

THE ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of the Architectural Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., Mr. H. T. Hare, President, in the chair.

The minutes having been read and confirmed, and some nominations having been announced, the following gentlemen were elected Members of the Association, *i.e.*, Messrs. W. Sykes George, T. C. Mannooch, P. H. Keys, Gordon Williams, and Ingleson C. Goodison. Messrs. A. Burnell Burnell and R. H. Kerr were reinstated, and the following gentleman was, on the motion of the Chairman, elected by acclamation, *i.e.*, Mr. J. W. Simpson, F.R.I.B.A.

Mr. R. S. Balfour, Hon. Secretary, stated that on February 12 the following class would commence, *i.e.*, "Hygiene, Ventilation, Lighting, and Heating," Mr. Max Clarke, lecturer.

Mr. Balfour also announced that the annual supper of the Camera and Cycling Club would take place at the Holborn Restaurant on February 21, at 7 p.m. The Camera and Cycling Club will be glad to receive the names of any members who could attend the supper and assist in the entertainment.

The Chairman announced a further donation to the New Premises Fund from Mr. Zephaniah King (second donation), 3*l.* 3*s.*

Letters regretting absence that evening were announced from Sir L. Alma Tadema, Mr. Walter Crane, Dr. A. S. Murray, Mr. R. Phenè Spiers, and Mr. F. C. Penrose.

The Chairman said he wished to say a few words as to the Class of Colour Decoration. This class in past years had had a fair number of members, and it had been carried on for a number of years with great success. The subject was an extremely interesting one, and he was quite sure that those members of the Association who had in the past availed themselves of the teaching to be had in the class had benefited very much by it. It was, therefore, a matter of considerable regret that the class was beginning this year with only two members. He hoped that any members who felt disposed, and were able, would join the class.

What is the Real Value of Greek Work to the Modern Artist?

Professor G. Baldwin Brown then read the following paper:—

In one sense no apology is needed for introducing before an architectural audience the familiar subject of the artistic work of the

Greeks. The supremacy of the Greeks in some of the branches of the plastic and constructive arts, their excellence in all, are universally admitted, and the advantage for the modern practitioner of a study of acknowledged masterpieces cannot possibly be gainsaid. But one remembers the old story of the Athenian citizen who voted for the banishment of Aristeides, because he was weary of always hearing him called "the just." It is possible that in like manner some who are here present may be a little tired of having the unapproachable excellencies of Greek statues and buildings set continually before them as a sort of reproach to modern shortcomings. If voting could be quite secret, and no one could know who had put in the black balls, a ballot among the younger and more ardent members of the professions of architect or statuary might result in something like a temporary ostracism of Pheidias and Ictinus, who would be followed into exile by Vitruvius and all his Renaissance imitators. It is quite possible, at any rate, that there is latent in some minds a certain feeling of impatience with regard to the exalted claims which are sometimes put forward on behalf of the arts of Greece, and it should be said at the outset that this paper is not written from the point of view of the professed classicist, in whose judgment the ancients could do no wrong. There will be some attempt, at any rate, to discriminate between what is of lasting and universal value in Hellenism, and what was for the time only, or was imperfect and even on faulty lines. At the same time it is to be feared that the "justness of Aristeides" will figure very largely in what follows, and those present must put it down to the nature of the subject rather than to the writer's intention if he fall at times into the sermonising vein. The theme of Greek work is not a "subject of the day." It does not "palpitate with actuality" or "bristle with points of controversy." It does not offer the interest of a fight. A generation ago this kind of interest would have attached to the subject, for there was then a pronounced antagonism between the votaries of the classical and romantic ideals, that is now quite out of date. In the first half of the last century romanticism in literature and in architectural practice was militant. Its attitude towards the neo-classicism of the previous generation was an aggressive one, and in France, at any rate, where they take these artistic questions seriously, the adherents of the two schools nearly came to blows. This intensity of personal feeling belongs to the past, and the Law Courts at Temple Bar represent perhaps the final effort of the Gothic revival as a form of artistic propaganda. In the present day we have settled down to a reasonable eclecticism that sees good in most of the established traditions.

This eclecticism is not a symptom of decadence, it is not a Laodicean indifference, but rests on an easy confidence that we are the "heirs of all the ages," and, from our place "in the foremost files of time," can survey the past and appropriate from it whatever seems to suit our personal needs. No one in the present day will break his lance upon the Greek façade in the spirit in which Ruskin tilted against it in his "Lectures on Architecture and Painting." The opposition which in the present day the votary of classicism will have to meet is not a militant opposition. He will find in some quarters people who are slightly bored by Hellenic achievement, and, though they accept it as beyond the reach of criticism, decline to trouble themselves to analyse its qualities or to assimilate its standards. He will find in other quarters a tendency to accept Greek work in a somewhat patronising spirit, with the proviso that it must have got a little fuzzled and warped and wavy through the lapse of ages, before the sensitive modern eye can take delight in it. Is it not the case that the mediævalist will sometimes offer a sort of apology for his admiration of Greek work, on the plea that, as we now possess it, its charm is so largely aided by the mellowing touch of time? The sculptor of to-day will sometimes tell us that the corroded condition in which works like the Elgin marbles have survived is to their advantage as works of art, and that they look better with the texture that time has given to most of the surfaces than they can have appeared in their pristine freshness. Mr. Walter Pater threw out the somewhat paradoxical suggestion that Michelangelo left his marble figures unfinished in order to obtain the same sort of effect that he saw in time-worn antiques. The notion in itself is, of course, absurd, for the state in which so many of Michelangelo's works have come down to us is due partly to his own temperament and partly to the circumstances of his career; while he imparted at times the most exquisite finish to marble, as in the Pietà at Rome, or the torso of one of these very same unfinished works, the "Slave" of the Louvre. The notion, however, though in itself absurd, is very characteristic of "romantic" art criticism.

There is, indeed, not a little affectation in the modern worship of the undefined, and to this a right understanding of Hellenic work supplies a much-needed corrective. It is a first principle in the study of that work that it must be accepted as it was at the moment of its completion, absolutely clear in its definition and thorough in finish. The finish that the Greek craftsman put on his work is the secret of some of its finest qualities. It is precise and smooth, while it yet shuns the rigidity and lifelessness that some of the neo-classic styles in the modern world have taught us to know and to avoid. It is, however, only shapes that are perfect in their beauty and expressiveness that can bear the pitiless exposure which exact finish carries with it. If form be not really fine and studied in all its contours, then "sensitiveness of surface," "suggestion," and "texture" make a very pleasing and attractive substitute. But it is only a second-rate achievement to cheat the eye with a vague impression of the artistic in broken colour and light and shade. The Greek artist would have looked on this device with something of contempt, and we can imagine how Lucian's satire would have played about the work of the artistic genius who did not quite know his own mind.

Greek work, accordingly, may be taken or may be left alone, but, in any case, the qualities by which it must be judged are those it possessed when it left the artist's hand, and not certain adventitious qualities it may have derived from the accidents of the centuries. Quite enough of this work has come down to us practically untouched for us to be able to judge how the work looked under the sun of Hellas. Though a good deal of the marble sculpture is corroded, of the bronze encrusted with patina, though the buildings have descended to us in a state of ruin, yet there are specimens or portions of each kind of work that are almost perfectly preserved, while smaller objects, such as coins, small bronzes, gems, goid ornaments, are sometimes as fresh as if they had just come from the workshop. No doubt there is an indescribable charm that may be given by "the mellowing touch of time;" and certain forms of Greek art, such as the terra-cotta statuettes, owe not a little to the broken tints, the dimpled surfaces, of the age-worn material. These particular works were always, however, rather sketchy in style, and do not properly illustrate the point at issue. There are, on the other hand, many kinds of work in which we give no value to these accidental graces. A perfectly preserved Greek coin—and the world holds no more beautiful work of art—is always more admired by an artist than one to which time has added "texture," and the contours of a hydria are not improved when one of the handles is broken off.

What now is the true value to the modern artist of Greek work of this kind, frankly accepted in the Greek spirit?

The answer to this question in its broadest aspect is already conveyed by implication in the query itself. It is obvious that the answer must be, to a great extent, an expansion of the simple thesis that it is the spirit of Greek work rather than its outward features that will be found of real value to the modern practitioner. The Classical Orders have supplied, it is true, a repertory of ready-made details that have been usefully employed in Western European buildings from the time of the Renaissance downwards. The forms in question are, in themselves, arbitrary forms, meaningless to the modern intelligence, and their continued employment in modern work is by some strenuously opposed. The movement known as the New Art Movement, for which Scotland, to its pride or to its shame, seems to be in some part responsible, aims at substituting for these conventional forms other forms devised on each occasion by the constructing artist. These forms, whatever else may be said about them, are, at any cost, original, and it is claimed for them that they are more interesting than the time-honoured exemplars which for three or four centuries since the Renaissance, each succeeding generation has tamely accepted from the last. So far as at present appears, the Classical Orders seem likely to hold their own; but it is quite an open question whether this is due to any inherent æsthetic virtues which they possess, or merely to the innate conservatism of the human mind. In other words, there may be a real, even a profound and cogent, artistic reason for the continued employment in certain kinds of work of Classical forms; and if this reason can be made clear, then the forms are no longer dead forms, but living, in that they answer to the needs of the present hour. On the other hand, the forms may be only retained as a mere matter of tradition, and if this be the truth, it may fairly be argued that they have become a sort of incubus on architectural practice, and by their deadening pressure flatten this into the academic. With regard to this question of the continued use in modern times of the ancient models, it is clear that it is no part of the business of the architect of to-day to erect Greek temples like the Madeleine at Paris, or, as at London and Edinburgh, to force the forms of the Erechtheium into the service of modern requirements. Our architectural classicism of the early part of the last century went too far in the attempt to transplant into the surroundings of modern life in North-western Europe the special forms of plan and elevation that suited the social and religious purposes and the climate of the Greeks. In Scotland much of the work of Hamilton and of Playfair, such as the High School at Edinburgh or the Royal Institution that faces Princes-street at the bottom of the Mound, are too artificial in their classicism to suit the taste of the present day, which, after the battle of the styles, has settled down, as we have seen already, to a moderate and common-sense view of things.

Perhaps in our own country St. George's Hall at Liverpool goes as far in the resuscitation of the antique as modern taste will allow. It is a monumental structure designed for a stately outward effect, and for actual uses fully in accord with the spirit of Attic culture. Hence the style has a natural suitability to the purpose of the building, while it is treated in so fresh and original a fashion that we have no sense that art is in bondage in it to archæology. A more limited employment of classical forms for domestic as well as for monumental purposes, we find in the neo-classic town architecture of eighty or a hundred years ago, of which the work of Robert Adam, in Edinburgh and London, is a central example. The scheme of the buildings in question is not classic, for the chief element in their architectural effect is the wall pierced with window openings, and this is not a form used in the antique world; but the details are largely drawn from the "repertory of ready-made details" just referred to. The question is whether the continued use of these is only a matter of unreasoning habit, or has for its justification some solid artistic grounds.

The merit of these features in themselves as perfected by the form-giving genius of the Greeks will be readily conceded, but the objection to their continued use is based on the fact that, though admirably fitted for their original purpose and surroundings, they have now become trite and conventional forms, with no significance for the world of to-day.

May it not be argued, however, that this very familiarity and conventional character of the forms in question is an architectural advantage? If the effects of architecture depend so largely on composition—that is, on the relations of proportion among the parts—the less attention the parts attract to themselves the better. The original features which the New Art movement has introduced into notice challenge attention by their novelty and sometimes by their strangeness, and even their uncouth aspect. Attention is in consequence distracted from the general effect, which depends on the harmony of relations, and is directed to the parts rather than to the whole. If these novel forms were good in themselves, we might be content to wait till we became familiar with them, and they dropped in consequence into the background. As a fact, however, the creation of satisfactory tectonic forms is a very much more difficult matter than some people imagine, and a repertory of features that are to take the place of the forms matured by the Greek masters of old is not the work of a single day or generation.

The question here posed of the artistic value of the stock of material features handed down to us from the antique is only a sub-question embraced within the larger inquiry formulated in the title to this paper, and it is well to begin by regarding the subject in its wider aspects, and to discuss rather the spirit of Greek work than the practical models which it supplies to the builder of to-day.

The spirit of Greek work can be best understood if we contrast the most characteristic artistic expression of the Hellenic mind, the Doric temple, with a monument that embodies as perfectly the opposite artistic tendencies which have been already referred to under the term "Romantic." The French cathedral of the thirteenth century shares with the Greek temple the distinction of representing the highest development of which architecture has shown itself capable. The two buildings are complementary to each other, each possessing characteristic qualities that the other lacks. Each is the expression of the ideal of an age.

The pedestalled isolation of the Classical fane, the clear-cut precision of its parts, where every ratio of size and place is studied, every profile matured with fastidious attention, are characteristically Hellenic; and by their own language these architectural features convey the central idea which in the moral life, in society, and in the state the best of the Greeks were for ever striving to realise. Against this Hellenic definiteness and lucidity may be set the comparatively mystical temper of the Middle Ages, and the cluster of multitudinous details, that in picturesque illusive outlines enfold the thirteenth-century cathedral, are creations just as characteristic of the romance and enthusiasm of the North.

Much of the impressiveness of mediæval buildings depends on the suggestion of mystery. Their interiors are amplified in effect by a disposition of the masses and the voids, which offers a "something beyond" in whatever direction we turn our eyes. Professor Freeman has remarked about the Gothic church:—"Place yourself where you will, the view is boundless, nothing occurs to force a limit on the eye in any direction; interminable rows of columns branch away to every point, arch is seen through arch, every feature suggests something beyond itself . . . even the apertures of the triforium, and the narrow passages of the highest range, give a hint of something yet further, of interminable mazes leading you know not whither."

Through this characteristic mediæval buildings appeal to the imagination to an extent unparalleled in the more severely bounded Classical structures, and they derive from this their special hold on our sympathies. Robert Louis Stevenson said somewhere that he liked a great cathedral; it was the form of mountain scenery that pleased him best. This is a whimsical way of putting the important æsthetic truth that the forms of architecture have not a little in common with the grander aspects of natural scenery.

The effects of mass, of height, of vastness, the charm of complex detail, the mystery of light and shade, we find on the one hand among the hills and forests, and on the other amid the towers and the aisles of our great mediæval monuments. In both cases the æsthetic impression is largely due to varying effects of lighting. Shadow, which by its suggestion of the unseen increases apparent magnitude, is a potent element in the sublime effect of the masses of both Nature and art. We are accustomed to study our great churches in the broad light of day, which fills their empty spaces and pitilessly exhibits to our view the fragmentary monument, the bare altar slab, the ruined shrine. Those who have been fortunate enough to visit some of these immense interiors in the gloaming, or at night when they are only partially illumined, know how they gain in the half-light both in added vastness and in the suggestion of complex beauty in details which we cannot fully explore.

It is at such times that we can reproduce to ourselves the aspect that the church wore in mediæval days better than in the full light of morning, or while the simplified modern rites are being performed at the rifled altar. The imagination will then readily travel back to the ages of faith and enthusiasm, when these colossal fanes were reared and embellished, with never-ending extensions of their spaces and ceaseless elaboration of fittings and enrichment. If placed alone at nightfall in an interior like that of Canterbury, or Lincoln, or Durham, the most pronounced classicist would surrender himself to the mystical suggestion of the scene, and recall the memories which the ancient walls enshrine. At such times we can fancy in the gathering darkness that there are altars and shrines along every aisle, and that every altar has a carved and painted canopy, each monument its screen of cut marble or of gilded iron. We see in imagination the last rays of the fading daylight enter, subdued but enriched, through the glowing windows, every pane of which is blue, or sanguine, or green, or gold. Anon the silver lamps and the iron cressets will be lit up, and we watch the faint radiance as it steals along the aisles, kisses the clustered pillars, and dies away into darkness below the fretted vault. Next, the voices of the singers, and the mellow notes of the wooden organ-pipes peal out for evening prayers; and then, still later, when all are gone, silence and gloom settle down upon the measureless spaces of the interior. But it is not wholly dark nor all untenanted. There at the extreme eastern end a light is set within the window niche, that through the night its rays may make dimly visible to the watchers the costly treasures piled around some venerated tomb. In their chamber hard by sit the guardians of the shrine, and now and again the footsteps of other vigilant custodians of relic or of treasure wake the echoes of a distant chapel as they tend a lamp or make fast a door. The hours pass away, and there is a stir among these ghost-like denizens of the mysterious shadow-land, and soon from the central tower the deep notes of a muffled bell sound forth the nightly summons to prayer. Pendant lamps are lighted above the altar. One or two ministrants enter the church and pass on into the Revestry to robe. Then along the vaulted aisle or from the southern transept, perhaps still half asleep or moving as if in dream, glide the dark-frocked monks or white-stoled canons to their office of vigil or of matin. The voices rise in the psalm, and echo along the dim and cavern-like nave.

With this general impression in our minds of limitless complexity, of surroundings only partly apprehended, that offer from every side some fresh appeal to the imagination, let us contrast the opposite impression of absoluteness and lucidity which we receive from the severely bounded forms of the Greek architectural monument. For this purpose we must select a building as nearly as possible complete. A ruined temple like the Parthenon is of little help save for the study of details, because it has lost just that characteristic of absolute symmetry and evenness which is the quality with which we are for the moment concerned. The comparatively perfect temple beneath the Acropolis, the so-called Theseum, is on rather too small a scale when measured with the rock-like masses of the Parthenon overhead, to produce a full architectural impression. A large temple, however, of an early period, roofless, but on the exterior otherwise well preserved, stands at Pæstum, in Southern Italy, and this is happily the best known and most accessible of all extant examples. The great temple at Pæstum is so situated that one comes upon it suddenly after walking a few hundred yards from a bustling little railway station, whither a crowded local train has transported us along five-and-twenty miles of hot and dusty railroad from Salerno. It bursts into view in a moment as we round the corner of a wall—a vast, clearly defined mass, golden in the sunlight against the grey green vegetation of the plain and the blue of the distant promontory. Its platform rises sharply on every side from abundant tufts of the beautiful *acanthus mollis*, from which is derived the leafage of the Corinthian capital, while in regular and continous order the ponderous Doric shafts are ranged upon its topmost level, and bear above them the great horizontal incubus of the entablature. The brilliantly illumined columns alternate with darkened interspaces, and in monotonous succession they follow each other in diminishing perspective along the receding face. Side corresponds exactly to side, end to end, and above the columns there is everywhere the horizontally bisected entablature, with the alternating triglyphs and metopes. The strong shadow cast by the projecting cornice and the gleaming strip of the corona crown the whole with an unbroken skyline.

The impression is at first one of overpowering magnitude, and the secret of this effect it would be interesting to trace. As a fact, the length of the building is much less than half that of the National Gallery in Trafalgar-square, yet no one ever received from the latter any impression of size. It is not, however, an impression of complexity, for the similarity of the alternating forms, by which we measure the bulk, forces itself on our attention, and we cannot escape obtaining from each of these forms a perfecly clear and definite impression, both in itself and in its relation to the other forms with which it is combined. The satisfaction which the eye receives, at first from the general mass and next from the forms in themselves and in their relations, is so complete that we ask for nothing more. We do not realise, or at any rate do not lament, that the building is absolutely plain, devoid of every touch of ornament, and of any colour save that of the actual material in which it is wrought.

There could be no more convincing refutation of Ruskin's famous paradox that the function of the architect is merely to supply a framework for the display of decoration in carving and colour. The artistic effect here is purely one of form, and the example supplies a potent argument in favour of those who contend that both architecture in its monumental aspects and sculpture are arts of form and of form alone. From the natural colour and texture of the materials employed they derive all the value that is possible, but except in the interiors of buildings where other considerations come in, they do not ask to be painted. Architecture, moreover, again in its monumental aspects in exteriors, as an art of form is independent of ornament. No one to whom Pæstum comes as a vision of power and beauty ever troubles about the untenanted pediment or the empty metope slabs. The austere plainness of the fabric only brings into clearer relief its inherent qualities of form and perfection.

For the secret of the effect of a fine monument of Grecian architecture is due first of all to the studied relations of form and size among a number of similar and often repeated parts.

Proportion, it need hardly be said, is the primal secret of the æsthetic effect of architecture, and no builders ever understood so well as the Greeks how to compass this effect by the simplest means. When the first overpowering impression of majestic repose we receive from a fine Greek monument has passed from the mind, we find ourselves balancing part against part, the uprights against the horizontals, the architrave against the frieze, the triglyphs against the metopes, the height of the column against its thickness, and finding everywhere the most absolute satisfaction in relations which we feel could not be more harmoniously combined.

As mere forms, through their shape and size and relations, the parts of the Greek façade give this satisfaction to the eye and to the sense, but we receive a further impression, and one of a more complex and intellectual kind, when we note the clearness with which each of these parts proclaims its place and function in the organism of the whole. Furthermore, a closer study directed towards the features in themselves, apart from their relations, exhibits each form worked out to the minutest detail, so as to satisfy alike the eye by its contour, and the intelligence by the fitness of its shape for the work it has to perform.

If we try to express now in a word or two some of the more definite and more practical benefits to a designer of a study of Greek work in this most monumental form, we may claim that it illustrates in the clearest and most convincing fashion some of the more important tectonic principles that apply to construction and decoration in general. Of tectonic principles Greek work is, indeed, the compendium. The Greeks are by no means always right, but their practice in these respects is more consistent and logical than that of any other artistic people. As a general rule they conceived with singular clearness the conditions of the artistic problems with which they had to deal, and were alert to seize, and give effect to, the suggestions of the material and the process which appeal so often in vain to the opinionated modern craftsman. But this expression "tectonic principles" must be further defined and illustrated.

[Owing to pressure on our space this week we are reluctantly compelled, contrary to our usual practice, to divide the report of the Architectural Association meeting. The remainder of the paper, with the report of the discussion, will appear in our next issue.]

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

I.—ROYAL COLLEGE OF SCIENCE AND VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON.

THE first spring visit of the session was made on the 7th inst. to the Royal College of Science and the new museum buildings now in course of erection at South Kensington, under the able guidance of Mr. Aston Webb, A.R.A. The Association visited these buildings in February last year, when, however, little more than foundation work had been completed; but the large party which assembled on Saturday clearly showed the interest which is being taken in these great schemes.

Mr. Aston Webb, with his usual unvarying kindness, was present, and when members had assembled opposite the Imperial Institute he gave a short and succinct account of the general lines upon which he had planned the Royal College and its relation to the neighbouring public buildings. A great deal of interest attaches to the fact that for almost the first time in the history of our country some definite attempt has been made by the powers that be to combine in one large architectural scheme the various Government buildings relating to science and higher education, and though, perhaps, the buildings separately are somewhat heterogeneous, the fact that one axial line passes through the centre of the Natural History Museum, the new Science buildings, the Imperial Institute (now London University buildings), the Royal College of Music, and the Albert Hall, and almost strikes the Albert Memorial, is a distinct step in the right direction. In order to further emphasise the general homogeneity of the group, and to enhance the symmetrical lay out, Mr. Webb has arranged the main entrance to the Royal College exactly opposite the entrance to Mr. Collcutt's building, and with the latter's permission he is reproducing at either end the domed pavilions which project in advance of the main frontage, and the new college will, therefore, reciprocate the general lines of the institute as to plan, while in elevation the long and low proportion of the former will not in any way vie with the latter. Those who were fortunate enough to be near Mr. Webb in the progress over the buildings must have been struck afresh with the mass of detail to be considered in the problem, and the masterly way it has all been arranged so that the efficiency of the college, both for professors, students, and the general public, is of the greatest. Some account of this appeared in the *Builder* for February 22, 1902, and therefore mention will only now be made of particulars then not touched upon.

The college is divided into two sides, chemical and physical, buildings relating to the former being placed on the east and to the latter on the west; the parts which require large rooms, such as lecture theatres and laboratory, are placed behind the main frontage; while the science library is placed on the first floor, over the central entrance. In this way it has been possible to design a symmetrical front with floor lines of the same heights all through, and, moreover, greater freedom from vibration has thus been secured to the more important experimental parts behind. This question of vibration is one of great importance in a scientific building of this nature in which the most delicate and exact experiments will be carried out, and Mr. Webb has gone into every detail with the various professors, and has embodied their requirements in his plans, so that it seems as if everything possible has been done to insure the success of the undertaking. For instance, to protect the physics buildings from the vibration of Queen's-road traffic, two underground parallel walls of concrete, with a space between them, have been interposed between the building and the road. As all iron and steel work had to be eliminated, the physics buildings are vaulted in concrete, 6 in. thick, filled in above with dry coke breeze, upon which ordinary concrete floors will be laid. These floors, however, will not touch the central piers, which are to act as "steady points" having projecting stone tables built into them, the piers themselves being constructed alternately of brick and concrete, with layers of felt in between to further minimise vibration. It is not too much to say that the building affords a fine example of the subordination of everything to the practical demands of science, and yet this has been attained without any loss of architectural character, and in some cases, such, for instance, as the vaulted ceilings, is probably a distinct gain. The great chemical laboratory, 75 ft. by 92 ft. by 30 ft. high, and the two fine lecture theatres, though well advanced, will be worthy of a more lengthy description when nearer completion.

Passing over to the museum buildings, considerable progress has, of course, been made since the visit of last year, and much that is interesting in the way of stone and iron work is now to be seen. One of the predominant factors in the plan has been the difficulty, always experienced in buildings of this kind, to get the public to visit galleries arranged anywhere above ground floor level, and therefore it was decided to cover the whole site without any internal light areas, making all galleries top-lighted, with the exception of those facing Cromwell-road, which are lighted from it. These latter galleries are 32 ft. wide, as experience has proved that up to this distance exhibits on the back wall can be well seen, with average window space in the wall opposite. These galleries are on three floors, the ground floor being 10 ft. above Cromwell-road, thus allowing of a well-lighted basement story, while the top floor is entirely devoted to students. At the back of these, and running right and left of the central entrance, is the great gallery, 700 ft. in length, 50 ft. wide, and 50 ft. high, with apses at each end, while at the north-west portion of the site is a fine circular gallery 110 ft. in diameter.

It should be mentioned that in this building also considerable attention has been paid to the mitigation of vibration; the whole of the brickwork is being built in cement, external and internal walls being 4 ft. and 3 ft. in thickness respectively. A Plenum system of ventilation, assisted in places with radiators, by which the air will be changed four times an hour, ought to effect a great improvement in the ventilation as compared with the present Museum; but it will be interesting to note if the system ultimately carries out all that is expected of it.

It is not possible to give a longer description now of all the many interesting points, but it is hoped that the Association will be able to visit these buildings each year until their completion. The nation has waited many years for a due appreciation of the needs of its science workers, and for a fitting storehouse for the national works of art, but both these requirements are at last within measurable distance of being fulfilled, and fortunately the fulfilment will take the outward expression of a fine architectural conception.

A vote of thanks, proposed by Mr. Louis Ambler, to Mr. Aston Webb for his kindness and trouble, concluded a most successful visit.

THE SURVEYORS' INSTITUTION.

AN ordinary fortnightly meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, Mr. Arthur Vernon, President, in the chair.

Mr. Penfold, Hon. Secretary, having read some donations to the library and library fund, and a vote of thanks having been passed to the donors,

Mr. W. Woodward read a paper, entitled "Some of the Difficulties which Present Themselves to the Architect and Surveyor Practising in London." Difficulty, or "rebuff," number one was as follows:—A lessee desires to pull down some business premises and to erect a new structure upon the site. He instructs his architect accordingly and directs him to apply to the freeholder for the terms upon which his wishes may be gratified. The first requisition of the agent of the freeholder, and a perfectly fair one, is that an undertaking to pay his fees, whether the transaction is carried through or not, shall be given; this is done, and the ground rent is ultimately settled. The ground rent is based upon the estimated value at so much per foot superficial over the whole site, and before the building is started it is found that the London County Council possesses very different views as to the area to be built upon, and for which the ground rent has been agreed. This is rebuff number one for the architect, and he so informs the agent of the ground landlord, pointing out that inasmuch as—for the public benefit—he cannot build upon the whole area for which his client has paid so much per foot superficial, he thinks that the rent should be reduced in proportion to the reduction of the building area. The architect, having waited for a month or two for the legal or official mind to grasp the difficulties of drafting a building agreement, submits his drawings to the agent of the freeholder, and here the second little repulse is met with; the force of the blow, however, depending to a large extent upon the freeholder or his agent.

The author said he had had transactions with at least four of the great London ground landlords, and whilst, with some, no more practical, simple, inexpensive, and expeditious method could be suggested, with others dilatoriness, vexatious requisitions, and costly impositions seemed inevitable. The fact that they were dealing with architects of experience and position, acting for responsible clients, did not weigh sufficiently with some of those gentlemen. The certainty that the new building would form a splendid security, and that the real interest of the ground landlord was at the end of the building term, sometimes escaped the agent's consideration, and after many months, perhaps, during which set after set of drawings had been submitted, the architect might find that the design of the chimney stacks was not thought to be satisfactory; that the shop front was not to their liking; that apparent as well as real support to the superstructure was desirable; and that the plate glass, for the space for which the lessee had paid so heavily, must be encroached upon by heavy stone piers. Every attention should be devoted to the architecture, so that London might be gradually improved in that direction, but when freeholders' requirements resulted in immediate loss to the lessee, he thought it was only fair that some of that loss should be borne by the freeholder. After this second rebuff, the architect went to Spring-gardens, and, armed with the certified drawings of the District Surveyor, found that, under Section 43 of the 1894 Building Act, he had to make special application to the Council to put up his new building, because it "deviated" from the old building. Before the Building Act Committee of the Council the architect's drawings were subjected to as complete an analysis as calm disregard of the value of time, and equal innocence of the value of property, could secure. Perhaps the architect had conceived that his designs fell in with a section of the Act dealing with his particular building, and so they might, but the gentlemen at Spring-gardens would discover that another section of the same Act could be brought into action. Again the experience and position of the architect were disregarded, and the officials would quite unnecessarily worry themselves over some utterly unimportant piece of construction which had not, perhaps, been clearly shown, and they reported to the Committee, and ultimately the architect might be informed that his drawings had not been approved. If the London County Council demanded wider streets and more open space round a building, coupled with reduced heights, those requirements resulted in improvements shared by the whole community, and the cost should be shared by the same community, not fastened solely upon the unfortunate building-owner, who should be fairly compensated for any loss he might sustain.

Assuming that the consent of the Council had been obtained, the architect was notified accordingly, and had to prepare a third set of the drawings, one of which had had to be drawn to an engineer's—and not an architect's—scale, and he was handed over to the District Surveyor. Here he might be on better and safer ground, but it would depend to a large extent upon the knowledge, experience, and practical-mindedness of the District Surveyor as to how far the architect might proceed. Possibly the District Surveyor might be a little nervous on structures, as such; or he might discover, in the fields before him, that even the gleaners at Spring-gardens had left a little to be gathered in. He gathered it, and pointed out that unless party-walls, which the architect considered quite good and sufficient for the purpose, were taken down and entirely rebuilt, he would put Spring-gardens again on his track, in the shape of a "dangerous structure notice." The defective wall matter having been settled, the architect discovered that there was another public authority, *i.e.*, the Borough Council. The architect was informed that the hoarding let by a client to a bill-poster on terms which would perhaps pay for the unnecessary party-wall business must not be posted over with advertisements at all; that if the architect did

not disfigure his stone front by soil-pipes and ventilating pipes he would hear of it; that if he attempted to emulate the works of the Borough Council in daring to put water-closets and urinals underground (although, perhaps, better ventilated than those of the Council), he would be proceeded against, as he would if he had the audacity to extend a vault under the footway or roadway to the extent of 6 in.; and finally, that the Council had, in the exercise of its wisdom, said an emphatic "No" to the London County Council's "Yes" to oriel windows which the architect had been dreaming of for years. Then there was, perhaps, a threatened injunction in regard to a small window, say, glazed with ground glass many yards off. The payment of 200*l.* and 150 guineas costs might allow the work to proceed after a loss of three months' time. The builder hinted that he should have to make a claim because the delay had carried him into short days. Then the adjoining owner made a claim for loss by reason of his trade having been interfered with by the dust and other nuisances to which he had been subjected during the building operations. An objection was raised by the water company on the ground that an attempt had been made to get three instead of two gallons at a flush, a few additional questions were raised by the District Surveyor and by the Sanitary Authorities, but all at last were disposed of, the lease granted, and the accounts all squared up.

All this was no imaginary case, and as a remedy he said the great ground landlords of London should work on better and more practical lines. They should make it quite clear, before settling the ground rent, what their ideas were as regards materials, general architecture, shop fronts, &c.; they should be far more expeditious in their dealings and not quite so grasping, as some of them are, in squeezing every penny they can out of the man who has to confront all the difficulties to which reference had been made, and to whom a little less rent would be of very great service.

The London County Council was, little by little, taking upon itself too much of the detailed work of the architect. It sought to enlarge its area of control over everything material and immaterial connected with building operations in London, so that unless some curb were placed upon its activity it would soon be almost impossible to even touch a brick without having first obtained the sanction of the Council. The architects' department of the Council was too much controlled by the committees, the majority of the members of which had vague notions of such highly technical matters as those of the business of the architect. The Council should not be converted into a large architectural *atelier* at the expense of the ratepayers. There was need for more consistency on the part of the Council. For instance, some members of the Committee saw no objection to iron and glass covered ways to hotels, restaurants, theatres, &c., whilst others were totally opposed to them. The result was sometimes this: if A was fortunate enough to get his drawings before one part of the Committee his proposed shelter would be approved; but if B was unfortunate enough to get his drawings, for a similar shelter, in the same street, before another part of the same Committee, his application would be refused. Why did not the Council say "We will not have these shelters at all," or "We will permit them subject to certain clearly-defined restrictions as to height, projection, &c."? Why should not Borough Councils say distinctly whether they will or will not permit water-closets in basements, where ventilation can only be obtained from the pavement lights or under the shop stallboard? At the present time some Councils do not intervene if the work is properly done, whilst others will not permit the water-closets at all. Then as to means of escape in case of fire under the Factory Acts, why could not a few practical architects be appointed, as a tribunal, to visit buildings under consideration and say at once what must be done to make the buildings they visit safer for exit in case of fire? Instead of this, a long list of requirements was sent, many of them indicating fads and imaginary catastrophes. Then there were the worrying, vexatious, and unnecessary set of requisitions sent once a year by the Theatres Committee of the Council, and two or three years after these had been complied with another and fresh set was sent; and these were, all the time, only "suggestions," and the executed works might have to be altered. Then why should not one ordeal serve for one building? First, there were the requisitions of the London County Council, then there was the District Surveyor, and then the Borough Council, and when they all had been satisfied, there was the sanitary inspector. A central body should lay down, once for all, clear and explicit rules and regulations regarding the building; that when that central body had been satisfied everything appertaining to the building (except the rights and easement of adjoining owners) should be regarded as settled; that such settlement should be in the hands of a few practical architects and surveyors, and that the London County Council, instead of seeking to extend its powers, should curtail them within their legal and legitimate limits.

He would suggest that rights of light cases should be taken out of the hands of the judges on the bench and be referred to a tribunal consisting of two or three architects and surveyors and one legal assessor; the expenses would be comparatively trifling, the expedition in settlement would be ten times greater, buildings would not be unnecessarily mutilated, and London would stand a better chance of being more rapidly rebuilt. The growth of London needed an entire alteration in the management of building matters. It was absolutely essential that a more practical and unwieldy department be created, with a Minister responsible to Parliament at its head.

Having referred to the want of clearness in Acts of Parliament, particularly the 1894 Building Act and the Workmen's Compensation Act—a want of clearness accentuated by the omission of all punctuation—Mr. Woodward referred to the proposed amendment of the 1894 Building Act, which, he said, would seriously affect all building owners in London. He could well see that compliance with the requirements of the County Council might render our street architecture much more unsightly than even now legislation made it, and that the combination of external iron fire-escapes, external iron soil-pipes and angles of 63½ degrees, must lead to a new style of architecture.

Mr. Howard Martin, in proposing a vote of thanks to the lecturer, said that perhaps the most interesting part of the paper was the entirely new light it shed on the character of the London architect. Most surveyors had had occasion to settle terms of agreement of all kinds with architects, and they had been accustomed to approach them (the architects) with a little fear and trembling. They had found architects hard-headed, shrewd men of business, singularly well able to take care of themselves and their clients. But architects were pictured in the paper as simple-minded men who fell into all the pitfalls made for them, and he knew of no character, in fact or fiction like the architect represented, unless it be Una in the Faërie Queen, who had no protection from the wiles of the wicked world, except her beauty and the purity of her personal character. There was another side to what had been written by the author of the paper. The author was a little hard on the ground landlords of London and their surveyors, who were surely not to blame if the innocent and guileless architect took a site without first ascertaining what portion of it he could cover with buildings. While it was annoying, too, to find that there were building requirements made by the Local Authorities, which, in their discretion, were exercised sometimes to one's advantage and sometimes to one's disadvantage, he was not sure that it would not be more annoying to find that there was a cast iron rule made to act in every case and always to be enforced. The requirements of the London County Council were defined by statute, and while, perhaps, no one knew what the statute meant in all points, architects appeared to be fairly well informed, and, within small limits, they knew what they could do. As to the approval of plans by the freeholders' architect or surveyor, he admitted that hardships sometimes happened if that architect set himself up as an arbiter of taste, and forced his opinions on another architect of taste, even in matters unimportant to the freeholder. But he did not think that such cases were numerous, and as a rule the freeholders' architect was very willing, provided the client's interests were secure and the building was to be solidly erected, to leave the lessee's architect to deal as he pleased with the special requirements of the work. As to ancient lights, they would all, probably, agree that what was wanted was an exceedingly simple, instructive, and inexpensive tribunal which could settle questions rapidly. The reference to sanitary inspectors would remind them of many galling experiences. He thought that few of them had not had experience of the ignorant sanitary inspector who was given a set of rigid rules, and these he was afraid to depart from in any case because of his ignorance, and he insisted on unsuitable and expensive arrangements in cases where they were useless and even hurtful.

Mr. P. E. Pilditch said, in seconding the vote of thanks, that the author seemed to have been badly treated by representatives of five or six different classes of persons. As to elevations in London streets, and freeholders and their architects or agents refusing to permit the whole front of shops, &c., to be given up to plate-glass, he hoped that Mr. Woodward had not been designing some of those truncated elevations which looked like the vanishing lady—with head and body, but no legs. He had a great deal of sympathy with the view that in our London architecture we ought as far as possible to show that there was an obvious substructure—a foundation upon which the superstructure exists. He knew that in some cases the lessee wanted as much show-case room as he could get, and in proper measure this was understandable, but we were not in New York, and we did not put everything aside for utility and without regard to æsthetic considerations, and he thought there was a good deal to be said for our practice to have reasonable piers. There was one respect in which the London County Council was sometimes the cause of delay. Sometimes drawings had to go before several Departments and Committees, and when that was so there was delay, owing to the want of centralisation in the Council's work which arose, not from any fault of the officials who administered the Act, but from the fact that the Council was housed in several buildings; one part of the Architect's Department was in Warwick-court and another part was in Spring-gardens, and so on, and there was no opportunity for the departmental staffs to meet together with that frequency which would do away with delay. He thought it would be a good thing for architects when those doing the difficult work falling upon the Council's representatives were housed under one roof. The suggestion as to light and air was a good one, *i.e.*, that there should be a tribunal to deal with these matters. But the tribunal Mr. Woodward suggested was not the tribunal that was proposed by the Joint Committee of the Institute of Architects and the Surveyors' Institution, and he did not think it would be quite so good a tribunal. The tribunal of the Joint Committee was more on the lines of the three surveyors appointed under the party wall sections of the Act—not necessarily the same men in each case, but men who were appointed by the architects dealing with the matter in the first instance. If there was to be any serious alteration in the way light and air cases are administered, there would have to be some alteration in the law as well as in the tribunal, for the tendency was growing to lay down rules of law contrary to the old laws, and much more onerous in its burthen upon the owner of the servient tenement than formerly.

Mr. H. H. Collins said he agreed with almost all that Mr. Woodward had said, for the grievances he mentioned were not imaginary. He had had something like forty years' experience of the Metropolitan Board of Works, and, worse, the London County Council, and while the officials were very courteous they were not always amenable to reason. If all these restrictions were put upon property its value must be diminished. As to the superficial area available for building on a particular site, it was only fair to the intending purchaser that the vendor should call attention to the fact that there was a certain line of front to which he would be compelled to build. It was true that the architect could discover that for himself, but it was often the case that the client did not come to the architect until long after the transaction had taken place. There was a grievance which had not been mentioned; when everything had been arranged, and one was ready to carry out the building, there was the tyranny of the trades unions, and often the work was delayed on that ground. As to sanitary inspectors, Mr. Martin's remarks were a little unfair. They were often "angels in disguise," benefiting the community to a great extent. The sanitary

inspector had to administer the Act of Parliament prepared by the County Council, and the rules and requirements were printed. As to light and air some alteration in the present procedure was required, but he agreed with Mr. Pilditch that any fresh tribunal would be useless if the law was to stand on its present footing, because decisions would have to be based on the ruling of the House of Lords. He thought that light and air actions were sometimes fostered by surveyors, and he had no hesitation in saying that certainly 25 per cent. of light and air cases were very little less than cases of blackmail. There were members of the profession who encouraged that kind of thing, and it would be well if something could be done to prevent this. The expense and trouble to the architect caused by the County Council was well known to the architect, though surveyors might not be so well acquainted with it. An architect would submit a set of drawings, and if he made one-eighth of an inch difference in his drawings he was asked to submit another and another set, and the expense, trouble, and irritation were great. There was no finality, and one never knew when one had finished with the County Council. Architects would be content if the Council would say what they wanted, and then, when the requirements were complied with, be satisfied. He thought Mr. Woodward was wrong as to oriel windows, but as to Clause 43 of the Building Act, it was a dead letter, and it was not surprising, for Acts of Parliament were most vaguely drawn because the Council and other bodies, instead of getting the expert opinion of the Surveyors' Institution and other professional bodies, left the matter to amiable gentlemen who knew nothing about building. It cost that Institution about 1,000*l.* to make the unworkable Act of 1894 as workable as it even is. In section 43 were the words: "no more land shall be taken," and it would have been thought that "land" would have been interpreted in the usual way, but the judges had concluded that it also meant the second, third, and fourth floors of a building. As a district surveyor, he would advise them not to apply to District Surveyors to pass anything under section 43. As to the amendment of the Act now under consideration, if passed it would be a cruel and unjustifiable thing, and it had already created a great amount of consternation in the City and elsewhere, and there was to be a meeting at the Mansion House to discuss the matter.

Mr. Howard Chatfeild Clarke said he ventured to dispute several of the indictments contained in the paper. Was it true that the great ground landlords gave undue trouble or imposed undue restrictions on the building lessee? That was not his experience. There were two or three large west-end building estates where undue trouble to the lessee's architect in the passing of the plans was not a fact and where the uttermost farthing for rent was not obtained. The freeholder's architect or surveyor must have some power of refusing the plans or of modifying them, but there was not much difficulty in getting plans passed on the big estates. Sometimes they might find, as he did recently, that the lessee's architect had provided a range of water-closets on the ground floor near an entrance, and he refused to pass the plans on that ground, and the architect, in this case, thanked him for pointing out the defect. He would rather take land from a large estate with its restrictions than from the small freeholder and his advisors. As to the amount of land available for building, that was what surveyors had to find out. It was their duty to find out what amount of land could be built upon and what restrictions there were as to light and air, &c., and he did not think there was any very great hardship in that. As to the County Council, was there any real difficulty in getting drawings passed when the architect had paid proper attention to the requirements of the Act? The fact was that it was when they had gone outside the Act that trouble took place. The County Council had a great official work to perform, and their work was carried out for the good of the many. We did not want a second Drury-lane or Clare-market district to grow up in London; we want London to become the finest city in the world. The conditions of the Council objected to were framed to give more air space, light, and decency in this great metropolis. Mr. Collins said the amendment of the Building Act was unjustifiable. That remained to be seen; but the object was to give better provision in factories for escape from fire, and surely every one must feel that every precaution should be taken to prevent the recurrence of a Queen Victoria-street fire. He did not think they should let it go forth that they regarded the amendments to the Act as unjustifiable, though the Bill would have to be seriously amended. As to the question of light and air, the Joint Committee suggest that, first of all, cases should be referred to the third surveyor, as in party-wall matters, and if that were done 99 out of every 100 cases would go no further; but there was a provision that if the parties were not satisfied with the surveyor's decision the matter could go to a tribunal formed more or less on the lines of the Tribunal of Appeal. If the Bill of the Joint Committee could be carried it would be found to be a workable scheme, and would knock the whole question of light and air on the head. The Bill ought to pass, for there were great hardships under the present law.

Mr. Henry Lovegrove asked if it were true that the ground landlord's surveyor demanded to be paid whether the transaction came off or not? He would be paid something, but not the full fee. As to the rights of light, no matter how good the Bill of the Joint Committee might be, it would not pass the House of Commons while there were so many lawyers there. Many trumpery claims were being made for compensation for loss of light.

A member having made some remarks in which exception was taken to some of Mr. Woodward's conclusions,

Mr. Wheeler, K.C., said that the true way to solve many of the difficulties referred to was to constitute a proper land court or tribunal of appeal. What was required was a land court or supreme court dealing with these matters.

Mr. Thomas Blashill said that fou teen years ago, when he went to the London County Council as Superintending Architect, a great deal of the procedure was well in hand, but a great deal more had to be created. His staff, when he left, was more than doubled, and for the time he was there he took the whole responsibility for what was done. The Superintending Architect could not carry everything on his back, but he had under him officers, who could not be there to defend themselves, who did a great deal of the work, but everything came under his cognisance before it reached the Committee, and so he was responsible. Mr. Woodward had not had the forethought or consideration to bring any specific case before the meeting, nor had any one else. Was that not surprising? People did not go to Spring-gardens to carry out the law, but in order to avoid carrying out the law—to avoid the stringency of the Act of Parliament—and if they could manage that without going to the Council so much the better. As no cases had been brought, there was very little to answer. Mr. Woodward complained not only of the London County Council, but of the District Surveyors, the Borough Councils, and every one else. His position in the paper was that of a misinformed man, who seemed to be ready to take land without seeing it, although every step he took was against enemies. One of his grievances was that there was no punctuation in Acts of Parliament! When a man was driven to that he was in a bad way. He would advise any gentleman who thought like that to spend a shilling and buy the Building Act and read it, and when he had understood it as near as he could, let him get the Liverpool Act or the Glasgow Act, and then he would see how tenderly he was treated in London comparatively. We were not able to build in 10-acre fields in London, but upon thoroughfares and close to land of adjoining owners, and regulations were necessary. It seemed to come to this, that regulations would have to be made by architects in each particular case if all objections were to be met. All they did at the London County Council was to see that drawings were according to the Acts of Parliament. Drawings were examined to see if they infringed the law in any other way than that about which the application was made, and that was objected to, but certain architects used to send in drawings making innocent applications but containing infringements in other respects, and when the simple thing was agreed to they told the District Surveyor that the drawings for the whole thing had been agreed to. The Council got taken in more than once that way, and the result was that the Council tried to see everything afterwards. Everything should be shown clearly in the drawings, and nothing that was not wanted. No copy of drawings was asked for except what was absolutely wanted, but if drawings were wrong, fresh ones had to be supplied later. As to glass-covered shelters, they were used, and were convenient at theatres, &c., and permission was given to erect them only for the purpose of protecting people who were often lightly clad. Then public-houses asked for them—not for purposes of shelter, but for purposes of advertisement, and the Council were not able to grant such applications. Applications to the Council were dealt with by experienced officers, and not by juniors—by men, often, who had passed with distinction the examinations of that Institution or similar bodies, and they had had a hundred times the experience of any gentleman who had spoken that evening. The members of the Building Act Committee of the Council necessarily became men of great experience in these matters of building law, and there were men on the Council who had had four or five times the experience in these matters that professional gentlemen gave to their pupilage. As to the proposal that three or four architects shall say what is to be done, Where were they to be found, and what were they to be paid? The best plan was to have something like the present arrangement. Some four or five years ago the London Chamber of Commerce complained to the Council about the hardships they were suffering under the Factory Act as to the delay in passing plans, and he had been able to show that the delay was reasonable. There was nothing at all in Mr. Collins's complaint as to the ⅛-in. difference in drawings.

Mr. E. W. Hudson suggested that the discussion should be adjourned.

The Chairman said he did not think there was any need to do that, and he put the vote of thanks to the meeting.

The motion having been agreed to, Mr. Woodward briefly replied, and the meeting terminated.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A Midland Counties district meeting of the Association of Municipal and County Engineers was held in the Council House at Birmingham, on Saturday, January 31, and was largely attended by members from all parts of the country. Mr. T. H. Yabbicom, C.E., of Bristol, President, was in the chair, and among those present were Messrs. W. Weaver, Kensington; J. T. Eayrs, Birmingham; W. Harpur, Cardiff; J. Lobley, Hanley; T. de Courcy Meade, Manchester; A. D. Greatorex, West Bromwich; J. Price, Birmingham; J. S. Pickering, Nuneaton; G. Green, Wolverhampton; P. G. Killick, Finsbury; H. J. Martin, Streatham; E. J. Silcock, Leeds; C. C. Smith, Sutton, and others.

The Lord Mayor of Birmingham was present at the opening of the meeting, and heartily welcomed the members to Birmingham. He was sure these meetings would tend to increase the practical knowledge of the members and would also be beneficial to the community at large. In his opinion they were raising the standard of knowledge of Municipal Engineers, and bringing about a better state of things regarding the health of the community.

The President having taken the chair, thanked the Lord Mayor for his reception and welcome to the members of the Association.

Mr. Pickering, Honorary Secretary, mentioned that, in accordance with the resolution passed at the last winter meeting in Birmingham, a small Committee, consisting of Mr. Price, Birmingham; Mr. Greatorex, West Bromwich; Mr. Wike, Sheffield; Mr. Lovegrove, Hornsey; and himself had been considering the question of by-laws relating to land, streets, and buildings, and were to issue a full report to the Council.

Mr. J. Price, Birmingham, mentioned the formation of a Public Officers' Club at 4, Whitehall Court, for which he bespoke the support of municipal engineers.

Ventilation of Sewers and Drains.

Papers on "The Ventilation of Sewers and Drains" were then read by: Mr. R. Read, Mr. A. W. Cross, Mr. H. H. Humphries, Mr. T. Caink, and Mr. C. Chambers Smith, Surveyor to the U.D.C., Sutton. The following is the paper by Mr. R. Read, City Surveyor, Gloucester:—

This subject has been a fruitful source of

controversy for the last twenty-five years, but it has rarely been discussed under more favourable conditions than the present. Usually the papers on this subject are crowded in amongst a number of others, or they are discussed by people who have no real knowledge of it; but here we have a gathering of gentlemen, each one of whom has a system of actual live sewers, in daily operation, under his charge; and it is only those who have studied the working of a system of sewers for at least twelve months, so as to observe them under all conditions of weather and season, who are capable of forming a correct judgment on the matter. And even to such a gathering the author would appeal—as a counsel for the defence would appeal to the jury—to dismiss all prejudice and preconceived assumptions from their minds in regard to the subject in order to deal with it upon its actual merits.

Let us consider, then, what is the action of a system of sewers and drains, and why it is necessary to ventilate them. A system of sewers consists of a number of branches, converging into main trunk sewers, which again converge into an outfall sewer; about nine-tenths of the whole would probably be pipe sewers, ranging from 9 in. to 18 in. diameter, and the remaining one-tenth would probably be brick sewers. The upper ends, or branches, will probably have the steepest gradients, the main trunk sewers somewhat flatter, and the outfall sewer the flattest gradient of all. House drains and street gullies will be connected at every few yards along the whole of their length: so that a system of sewers is a system of perforated pipes having varying gradients, converging to a common outfall. The discharges from the house drains are intermittent, but as their aggregate length is about five times that of the sewers, their numbers enable them to create a continuous current through the sewers, except possibly at the extreme upper ends of the branch sewers, for a distance of from 50 yds. to 100 yds. from the summit, where the drains may not be sufficiently numerous to produce a continuous current in that length of the sewers. If a system of sewers is to be self-cleansing it must be so proportioned and graded that the flow of sewage has a minimum velocity of 3 ft. per second, or about two miles per hour, which is sufficient to discharge the sewage at the outfall from the majority of towns in two or three hours. If in some cases the gradients are not sufficient to give that minimum velocity, special methods of flushing must be resorted to, in dry weather, to keep the sewers free from deposit. If deposit occurs in a sewer it arises from one of the following causes:—1. Flat gradients. 2. Insufficient flushing either at the water-closets or in the sewers themselves, the water-closets being the proper initial point of flushing, as from this point it traverses both drains and sewers. 3. Inefficient, or neglected, street gullies and manhole buckets; and 4. What sometimes happens in a new district, insufficient live drain connections, that is to say, the sewer will be laid in the street of sufficient size for future requirements, but there may be only half a dozen houses built and occupied for several years; the result is that, however well the sewer is graded or constructed, the sewage from this small number of houses is lost in it, the water running away and leaving the solids stranded behind it, to be shifted on a further stage by the next discharge from the house drains.

If a deposit occurs in any sewer from bad design or bad construction, this can only be remedied by reconstruction on better lines and levels, but ventilation has often been blamed for calling attention to this requirement. All the causes of deposit mentioned above are more or less preventable, and if there is no deposit in a well designed and constructed sewer, Why is ventilation necessary? The dry-weather flow of sewage through a system of sewers gradually increases and decreases in quantity—that is to say, from a minimum at about 3 a.m. it gradually increases to a maximum about 3 p.m., remains near the maximum until about 7 p.m., when it will begin to decrease until it reaches the minimum again at 3 a.m. This, of course, means that a large amount of air must be displaced from the sewer, while the sewage is increasing in volume, and a corresponding amount of air taken into the sewer as the sewage decreases. The air which is displaced by the sewage must go somewhere, either up the house drains or through any manholes or ventilators which may have been provided.

Complaints of nuisance from sewers are generally confined to the six months of the year between the end of March and the end of September, and more especially occur after a few days, or a week's dry weather; then the ventilation is generally blamed by the public as the cause of the trouble. Ventilation is necessary to provide for the escape of the air displaced by the rising sewage, or the air would be under compression, and would force any traps which might be inserted for keeping it in the sewers, and the longer the time required to sufficiently compress the air to force the traps the worse would be the final result.

The methods of ventilation now in use may be classified as follows:—1. Openings in the manhole and lamphole covers, at the street surface, at various intervals ranging from 40 yds. upwards, but usually about 60 yds. to 100 yds. apart, the openings varying from 36 sq. in. per manhole upwards. 2. Vertical shafts attached to buildings, trees, telegraph poles, or self-supporting, 4 in., 6 in., and 9 in. diameter. 3. Various combinations of surface gratings and ventilating shafts, generally in wrong proportions and positions, owing to legal difficulties. 4. Connexions to factory chimneys. 5. Various patent systems of induced current ventilation by means of gas jets, water jets, or compressed air. 6. Systems of deodorising the gases given off at the manholes by the introduction of chemicals.

The first system discharges sewer air or gas immediately under the noses of the people, and is uncertain in its action. The second is an improvement on the first, inasmuch as it discharges the sewer air at a point varying from 20 ft. to 60 ft. above the street level, where it is not so noticeable, and has the advantage of being exposed to any wind which may be blowing. The third system, a combination of surface grids and vertical shafts, has seldom had a thorough trial in the proper proportions, and arrangement, which are necessary to harmonise with the action of the sewers and thus convert it from a haphazard into a scientific and reliable system. The remaining systems are altogether too costly for general application, although they are occasionally useful for isolated cases of offensive manholes, to avoid the expense of a reconstruction of sewers.

Let us now consider what happens to the sewer air, in a well-constructed system of sewers and drains, with the sewage flowing at the minimum rate of 3 ft. per second. In the summer time the temperature of the flowing sewage would range between 50 deg. and 52 deg. Fahr., and the sewer air over the flowing sewage would range between 52 deg. and 55 deg. Fahr. in twenty-four hours, while the outer air at the ground level during the same period may range from 50 deg. Fahr. up to 75 deg. or 80 deg. Fahr.; and, speaking generally, during the summer months the sewage and sewer air are at a lower temperature than the outer air, while during the winter months the reverse will probably be the case. But although this is true as a general rule there are times during possibly each twenty-four hours in which the relative temperatures overlap each other. This is especially the case at sunset in the summer time, when the radiation from the surface of the earth reduces the temperature of the air in contact with it at the ground level to the same or a lower temperature than that of the sewer air. The result is that in cases where the sewer is ventilated only by gratings at the street surface an escape of sewer gas occurs, generally just about dusk in the evening. But after a few days of dry weather the outer air has a low percentage of humidity, and the longer the drought continues the greater is the capacity of the outer air for absorbing moisture. The result is that any wet surface, such as the surface of the flowing sewage, and which is generally the only wet surface available, gives off watery vapour freely. This watery vapour is charged with organic matter from the sewage, and, having about half the density of dry air at the same temperature, it naturally rises from the manholes into the open air, and thus causes a nuisance. This continues with increasing offensiveness as long as the dry weather lasts, and usually the break up of the dry weather is preceded by a fall of the barometric pressure, which again releases a further quantity of watery vapour, charged with organic matter from the sewage, and the nuisance is at its maximum, because the sewage is in its most concentrated form, the sewer air is at its maximum quantity, and the outer air at its greatest capacity for absorbing moisture. It is this watery vapour under these conditions that the ventilation has to deal with, and which cannot be dealt with by any other means, although flushing may be a temporary remedy; but even if the Borough Surveyor doubles his daily consumption of water for this purpose, it would be a mere flea-bite compared to a good shower of rain. The municipal sewer-flushing can only touch the sewers, and has no effect on the house drains, which can only be flushed from the water-closets, the sink, and the bath wastes.

If the sewers discharge the sewage to the outfall at the minimum rate of 3 ft. per second, it should arrive there long before it has time to set up putrefaction; therefore the watery vapour rising from the sewage should not be putrid; but it generally is so, for three reasons, viz.:—1. The alternate wetting and drying of the sides of the sewer, owing to the rise and fall of the sewage. 2. The discharges from the house drains are more or less decomposed, owing to the interposition of the intercepting trap which acts as a cesspool; and 3. For want of proper ventilation.

In the absence of any deflecting influence, vapour rising from any wet surface rises perfectly vertical, but being of so light a character, it is easily deflected in any direction, and watery vapour rising from the surface of sewage in a sewer would naturally rise vertically against the crown of the sewer, and would roll slowly along the top of the sewer in an upward direction. But the motion is exceedingly feeble, and, therefore, the motion of the sewage flowing at the rate of 3 ft. per second, is a comparatively powerful force, which easily carries the watery vapour with it down the sewer, by friction of the two surfaces of water and air in contact; and the friction of the air and vapour against the crown of the sewer acts as a brake, retarding, but not preventing, the flow of air and vapour in the same direction as the sewage. The vapour following the flow of the sewage naturally eddies up each drain opening which it comes to, and also expands into the manhole chambers, so that the velocity never increases to the same rate as that of the sewage; but at the upper ends of the branch sewers, where the flow in the sewer for the first 50 or 100 yards is as intermittent as that of the house drains, the sewage has not the same power over the vapour, and its natural tendency to rise vertically may be sufficiently strong to carry it out at the top manhole grating, from that short length only, and thus gives rise to the popular error that the sewer air from the whole system of sewers rises towards the upper manholes of the system. This action can easily be proved by forcing smoke from an Eclipse machine into a manhole, say in the middle or at two-thirds from the lower end of a street sewer, with the smoke nozzle in the sewer, pointing up the gradient, and it will be found that the smoke will appear in succession at all the manholes below this until the sewer is full of smoke, when it will also come out of the manholes above the point of entrance.

Any system of ventilation, to be efficient, must coincide with these actions of the sewage and sewer air; each length of sewer between a pair of manholes must have its own system of ventilation, the inlet being at the upper end of the length, at the street level, and be kept as small as practicable, and the outlets distributed at even distances over the length below to the next manhole, and be as numerous as possible. This can only be done by abolishing the interceptor, and making the ventilating shafts on every house drain assist in ventilating its own length of sewer, between the nearest manhole on either side of it. In this way, a large number of ventilating shafts above the houses are brought to bear upon the one inlet at the upper end of the, say, 100 yards length of sewer, and, therefore, the air enters at this inlet with a velocity greater in proportion to the difference between the area of its opening and the aggregate of the number of shafts between it and the next manhole below, and the greater the excess of the shaft outlets over the manhole inlets, the stronger will be the velocity at the inlet and the less liable will it be to be reversed.

If there is any wind, however slight, or from whatever direction it is blowing over the tops of the outlet shafts, provided that it is not artificially deflected, this will only increase the

velocity at the inlet. This proposal has always been met by the statement that you are passing the sewer gas through the house drains, and thus endangering the health of the inhabitants of the houses; and it was to try and prevent this that the intercepting trap was adopted, without investigation of any kind, into the Model By-laws in 1877, because the doctors said that "sewer gas must be cut off from the houses." As an abstract proposition this requirement is perfectly correct, but the method of carrying it out by means of the intercepting traps is both absurd and dangerous. The trap is no protection to the house whatever, the real safeguard being the soundness of the drains. If the drain is sound the trap is absolutely useless, and a dangerous obstruction; and if the drain is not sound, the trap is also useless, because the emanations from the drain itself, and from the stagnant sewage in the trap, are quite sufficient to poison the whole household without any aid from the sewer. Intercepting traps, in their most approved form, hold about two gallons of stagnant sewage; they cause a retention of from 25 per cent. to 30 per cent. of the solid matter in the trap; they paralyse the flow through the whole length of the house drain, and cause it to become coated with putrid sewage throughout; and they absolutely prevent proper ventilation of the sewers. They are liable to be forced from the sewer side by the compression of the sewer air against them by the rising sewage; they necessitate a brick chamber and a so-called fresh air inlet, which has by force of circumstances to be placed within a very few feet of the front door or front window of the house, and every time the drain is used the mica flap-valve in connexion with this fresh air inlet is violently closed, and if the valve is not very soon broken by this violent flapping action, the compression of the air in front of each discharge from the water-closet against the sewage in the intercepting trap partially untraps it. The drain air then passes on into the sewer, and the sewage dribbles slowly into the inlet side of the trap, and slowly out of the outlet side, in the feebiest possible manner, into the sewer charged with putrefied organic matter, which the sewer ventilation, in whatever form it may exist, has to deal with and gets the blame for. Equilibrium is restored by the sewage filling up the trap, and the process is repeated by the next user of the drain; but in the majority of cases the flap-valve at the fresh air inlet is either not air-tight, or is broken, and if the intercepting trap escapes being forced, owing to this defect in the fresh air valve, a strong puff of drain air is discharged under the windows or by the front door of the house during every use of the drain. The usual result of this is that the householder promptly stops up the fresh air inlet altogether, and then the last state of the intercepting trap and drain is worse than the first. And besides all this, the intercepting trap is liable to partial stoppages by an excess of paper, or a dish cloth, or any solid matter being put down the drain; then the sewage rises in the intercepting chamber and drain, until it has obtained sufficient head to force the obstruction, and some 30 sq. ft. of brick surface is fouled with sewage. But occasionally the head in the chamber is not sufficient to force the obstruction, and then the builder, or the inspector of nuisances, or both, have to be called in, the obstruction is pushed down to the bend in the sewer junction, and a message sent to the surveyor, that the sewer is blocked, although the neighbouring drains are still running.

In the majority of towns now, all drain joints are made in cement, and the drains thoroughly tested before being allowed to be covered up or used, and strict regulations are made as to the fall, usually not less than 1 in 48 or ½ in. to a pipe being specified, and any inspector on testing the pipes, and finding one with a back fall—or merely level without any fall at all—would immediately condemn the drain and have it pulled out and relaid. But the same inspector, under the Model By-laws, is compelled to introduce into the lower end of the flattest part of the drain an intercepting trap, which causes an obstruction from 6 in. to 8 in. deep, full of stagnant sewage; and the believers in this trap assert that they are thereby saving the lives of the inhabitants of the house by cutting off the sewer gas, a statement which is altogether erroneous, as the trap is simply a manufactory of sewer gas on every house drain, pouring sewer gas into the sewer, which any system of ventilation of the sewers is blamed for, and is powerless to deal with or prevent.

The patentees of a certain chemical process contend that owing to the temperature of the sewer air being generally cooler during the summer than the outer air, it is impossible for it to rise out of the sewer during the summer months, especially if charged with the heavier gases of decomposition, and that it accumulates during these months, to be discharged during the autumn or winter, when the sewer air is generally warmer than the outer air, and in this way they account for epidemics such as typhoid and diphtheria occurring in the autumn. But this statement about the differences of temperature during the summer and winter months is only partially correct, as has been shown in an earlier part of this paper. There are times during the twenty-four hours, more specially about sunset, when the temperatures overlap each other, and thus bring the sewer air out into the outer air; and there is also the difference in density of the watery vapour, as compared with the outer air, constantly acting in dry weather, as well as the fall of the barometric pressure, causing discharges of sewer air into the outer air, quite independently of the relative temperatures.

In conclusion, the author would like to try an experiment by omitting the interceptor trap on all drains which are outside the houses; the drain will thus get a better gradient throughout, and no possible harm can be done to the householders, while great benefit would accrue to the sewer, which would be properly ventilated and be kept much cleaner.

Mr. C. Chambers Smith, in his paper, said:—"The wind bloweth where it listeth, and thou hearest the sound thereof, but canst not tell whence it cometh or whither it goeth." Such is the impression gathered after reading through a number of statements in scattered papers on ventilation in general—and of drains and sewers in particular—which is dependent upon the variable and fickle movement and temperature of the atmosphere. It is some fifty years ago since attempts at the ventilation of sewers were made in London; and although at that time considerable thought and attention were given to the question as to whether sewers could be ventilated in the same manner as mines, and several experiments were made, the idea was given up, and a notable authority pronounced that it was impracticable. Spasmodic attempts have been made at various times and places, chiefly by connecting sewers with furnace chimneys, to induce currents of air to sweep through sewers with a more constant energy and direction than could be obtained by atmospheric influences only; but such attempts have, either through entire failure or meagre results, not attracted the attention of surveyors to the extent of their being generally adopted.

We have almost universally fallen back on the question as to whether open manhole covers or vent shafts should be adopted, or in some instances whether any ventilation at all should be allowed, with the notion that, if the sewer gases could be "bottled up" in the sewers, the difficulty of dealing with them would be obviated.

Many have been the tests of the movement of air in sewers, vent shafts, manholes, &c., amongst which may be mentioned those by the late Mr. W. Santo Crimp at Wimbledon, and by Mr. E. George Mawbey, a Past President of this Association, at Leicester; the conclusion come to by both these gentlemen being that the wind "was the factor requiring the greatest consideration in determining the arrangements and positions of ventilating shafts." Mr. Mawbey gives some diagrams of his tests which seem to show that temperature is also an important factor, and, generally speaking, when wind velocity is high, and the air temperature low, the greatest current through vent shafts is obtained.

The author does not know, unfortunately, of any tests which show the length or capacity of the sewers which may be affected by a vent shaft, and it would be valuable information, tending to a better understanding of the subject, if, when ventilating tests at vent shafts were made, the volume of the air and the capacity of the sewer affected thereby were noted. The author assumes it will be granted that ventilation of sewers is necessary. "Bottling up" is impossible, as the sewer gases will find their way at some point or other into the atmosphere—so that the more perfect and constant the ventilation of drains and sewers is made, the better for the community.

The duty of dealing with organic refuse of all kinds is a necessity, and is not a very popular subject. We would all like to avoid the question as much as possible. But, by approaching the matter in a scientific way, much has been done in successfully treating liquid and solid refuse, and converting them into innocuous and harmless (and, in many instances, beneficial) products. It now seems to the author that gaseous refuse should also be approached in a more scientific and methodical manner than has been done hitherto.

At the Sanitary Congress held in Manchester last September, at a meeting specially to consider the question of ventilation of sewers, some of the members went not merely to the extent of discussing ventilation *per se*, but so far as to discuss the question of treating the sewer air by cremation or by chemicals, so that the pathogenic germs and poisonous gases should be destroyed—no doubt an excellent proceeding, if it can be brought within practical limits. Before such treatment of the gases can be attempted, however, it is absolutely necessary they should be brought under control both as to volume and place of exit from the sewer. This consideration brings us to the weak points of all methods of ventilating drains and sewers by utilising atmospheric influences only—namely, that in no such method can the volume of air or point of exit be controlled.

Apart from any question of treating the issuing sewer gases, the control of the volume and direction, as well as the choice of a place of exit, are important matters as regards ventilation of itself, and any method which gives such control and choice is based upon correct principles. The author considers it hopeless to obtain control if atmospheric influences alone are depended upon, and he is driven to the conclusion that mechanical means must be resorted to for efficient ventilation of drains and sewers, notwithstanding the apparent failures resulting from attempts at such means in the past. The "Shone" system, introduced by Messrs. Shone & Ault last year, seems to promise success in the direction referred to, inasmuch as the authors have approached the question in a scientific manner, and in a way which has been influenced by their long practical acquaintance with coal mine ventilation. This system, simply described, is a means of extracting air from drains and sewers by a fan driven electrically or otherwise, and the controlling of all air admitted to the drains and sewers by openings regulated in diameter in accordance with the volume desired to be admitted at any one point, and the vacuum available at that point. By such means it is claimed that fresh air is admitted at a soil pipe or interceptor, drawn down the house drain, away to and along the sewers to the fan, and thence up a vent shaft (in a chosen position) into the atmosphere. The volume of air admitted can be proportional to the sewage flow, or in other words, to the population served. The authors of the system state that one-tenth of a cubic foot per minute per inhabitant will give an excellent dilution; and, basing a comparison on some analyses of sewer air by Dr. Letheby, the CO_2 would be increased from the normal of 4 parts per 10,000 in the outside atmosphere to 4½ per 10,000 in the air issuing from the vent shaft. As a trial installation will be completed and tested at Leicester in a short time, and another installation completed at Darley Abbey, we shall soon know whether Messrs. Shone & Ault are justified in their claims. If they should be, a great step in the efficient ventilation of drains and sewers will have been reached. In conclusion, the author would point out that, as regards the after treatment of sewer air, the regulation of the admission of air to the drains and sewers is a means of keeping down the volume of air to be treated by cremation or otherwise within reasonable limits.

Mr. W. J. Steele, A.M.Inst.C.E., Deputy City Engineer of Bristol, said Bristol had frequently been mentioned as a city where the sewers were not ventilated; it might, therefore, be interesting to consider the general conditions of its sewerage system. All the manholes and lampholes on the sewers in the city were sur-

mounted by closed covers, and no means were intentionally made to provide a communication between the sewers and the atmosphere. There were eight outfalls into the River Avon, fitted with tidal flaps, the head against the bottom of which, at high-water of ordinary spring-tides, varied from 7 ft. to 20 ft. Six small storm overflows from one intercepting sewer discharged into the River Frome, four being fitted with flaps. The city formed a basin, the general level of whose perimeter was about 240 ft. above the Ordnance datum, and whose centre was about 27 ft. above such datum; consequently the fall on the sewers was considerable. All street gullies were trapped. Since 1882, drains connected to the sewers had been provided with an intercepting trap. On the building side of this trap a communication was made with the atmosphere, and another near the highest point of the drain. Every building used for human habitation was provided with at least one water-closet, usually of the pedestal form, and all roof-water, bath and sink waste-pipes, discharge over trapped gullies. Prior to 1882, intercepting traps were not compulsorily fixed in the drains, although some were voluntarily, but before this date the sink-stones, water-closets, baths, and similar fittings were provided with some form of trap. Possibly there were several instances where a roof water-pipe forms a means of communication between the sewer and atmosphere, owing to there being no water-seal between such pipe and the sewer; unfortunately, however, the number could not be stated with any degree of accuracy. If any notification of bad smells in or about buildings was received, the sanitary inspectors of the health department immediately made an investigation, and, if necessary, caused the drainage system to be modified on the lines indicated. During the year ended December 31, 1901, over 4,800 systems were amended. During the year ended December 31, 1902, only ninety-one complaints were received of bad smells in the streets, and these were in every case found to be from gullies, which, from defective traps, had the water-seal broken. From what had been stated above, was it possible to say that the practice, as applied to Bristol, of not intentionally providing any means of communication between the sewers and atmosphere, was wrong in principle?

What were the functions of a sewerage system? In his opinion, they were the means of removing the liquid refuse of a community with as little danger to the public health as was possible; even on economic grounds, the health of the inhabitants of a town was of importance, as lowered vitality means loss of earning power. The death rates were as reliable a test of the health of a community as was at present known. A diagram was submitted showing the death rates per 1,000 living during the ten years 1891 to 1900 inclusive of the average of the thirty-three great towns, and those which might reasonably be said to be of a similar character to Bristol and Croydon were inserted, although they did not quite resemble Bristol, inasmuch as they were of a residential character, whereas Bristol was principally a manufacturing locality; but as they were celebrated for low mortality rates, it had been thought advisable to include them. The income of the average individual is likely to be higher in a residential locality than in one of manufacture—an important factor in considering the health of a community. Moreover, the risk of death in the former, owing to the nature of occupation of the inhabitants, was less. The epidemic diseases—diphtheria, fever, and diarrhœa—were given, as they were said to be the only diseases in which sewer air played any part directly or indirectly. The infantile mortality was given as showing the chances of life of infants under one year From all causes, the Bristol rate was higher to a degree in the order named than that of Croydon, Brighton, and Portsmouth, equal to that of Leicester, and lower than all others. From diphtheria, the Bristol rate was higher than that of Bradford and Nottingham, but lower than all others.

From fever, the Bristol rate was higher than that of Croydon, but lower than all others. From diarrhœa, the Bristol rate was higher than that of Croydon, but lower than all others. The infantile mortality in Bristol was higher than that of Croydon, but lower than all others. The responsible authorities in Bristol had quite an open mind on the question of sewer ventilation in general, but they held the view that it had never been demonstrated that the practice at present applied in Bristol was prejudicial to the health of its inhabitants. In considering the subject as a whole, he ventured to submit that the numerous experiments made in various towns had been somewhat incomplete, and thought if any general principle could be laid down, it should be done by a Commission representative of Preventive Medicine and Engineering which might experiment throughout the United Kingdom.

Mr. J. Price, Birmingham, proposed a vote of thanks to the authors of the papers. He had seen Mr. Cross's apparatus at work in King's Norton, and was surprised at the large volume of air passing through, induced by a small water spray. The system of ventilation adopted in Birmingham had been by open ventilators in the streets, added to by high shafts. As to mechanical ventilation, he investigated a system some years ago where it was proposed to build high chimneys, furnaces, and fans at a cost of 125,000*l.* for the installation and 12,500*l.* a year for the working expenses. Any system adopted by a municipality must have some relation to cost.

Mr. J. Parker, Hereford, said that four of the authors agreed that the old system of ventilation by open gratings at the street level was a failure, and the majority gave a modified approval of ventilator shafts with outlet and inlet openings. Mr. Read objected to the intercepting trap, but it was here, and had come to stay for some time. He was entirely out of sympathy with both the arguments and conclusions of Mr. Cross. His objection to Mr. Cross's invention was that without the water spray the method was costly and complicated, and with the water spray it was absolutely impracticable. Air inlets or outlets which depended upon the correct action of either mica or aluminium valves were, for reasons stated in Mr. Read's paper, absolutely unreliable. The invention had thus all the defects of the shaft system, without its economy. As to Mr. Cross's proposal to use the water spray in the way suggested as a motive power to promote sewer ventilation, in the interests of the water consuming public he entered his emphatic protest against it. The risks attending such connexions were great. Indeed, modern rules and regulations as to water supply forbid such a connexion.

Mr. Savage, Birmingham, said, in considering what remedy to apply they had first to consider with what they had to deal. In the first case, a defective sewer in which putrefaction was taking place; in the second, a clean sewer free from deposit, but giving off most offensive smells. Clearly reconstruction was the proper remedy in the first case, or failing that continual flushing; but as regarded the second, why should they go to the expense of costly systems which aimed at destroying by cremation or other means the germs of disease so popularly supposed to be associated with foul smells, but which existed more in imagination than reality?

Mr. W. Weaver, Kensington, said this question had been before the Local Government Board and the London County Council for twenty years, and they had had the best advice and engineering skill that money could procure for them, and the result was they recommended, first, that the sewers should be properly constructed, and, second, that they should be kept clean and provided with a current of fresh air running through them. If he was laying out a model town, he would not have a single siphon-trap, and then he would expect to have a constant flow of fresh air through the sewers. But they had got the siphon-trap, and it had come to stay, like a poor relation. He was quite at one with Mr. Read and the other authorities who agreed that the siphon-trap was a great mistake. But the trap had come to stay, and the question was, What was to be done to remedy the present state of things? Mr. Caink seemed to advocate the bottling up of the smells in the sewers, and the filtering them through a respirator. Of course, in some exceptional positions, that might be advisable. He believed they did something of the kind in the House of Commons—not of filtering the speeches before they got out to the public, but of filtering the air before it got into the speakers. They had a meeting of all the engineers of London two years ago, presided over by Sir A. Binnie, to consider what should be done to meet sewer smells in London. They were entirely at one in objecting to the siphon trap, but looking to the complication of old drainage and so on, they could not recommend the abolition of siphon traps on the drains, unless the whole of the drainage was reconstructed, but they recommended wherever a siphon trap was inserted that the householder or whoever was doing the work should put up a ventilating pipe on the sewer side of his interceptor. But he was sorry to say that their recommendations, when sent round to the Local Authorities, did not find acceptance, and they were thrown back on shaft pipes.

Dr. Dearden, Manchester, said they were starting experimental works in Manchester with reference to the ventilation of the sewers. They had given instructions to Professor Delepine, as an expert bacteriologist, to take up the question of the air in sewers and the relation which it bears to the health of the people, and he had no doubt they would be able to publish important results. He was surprised that four of the authors considered the proper way to ventilate the sewers was to utilise the ventilating shafts of the house drainage system. That was not their idea in Manchester.

Dr. Bostock Hill, Birmingham, said he could see that the intercepting trap was not beloved of engineers, and he did not wonder at it, but at the present time it would undoubtedly be dangerous to the health of the community to dispense with it.

Mr. E. J. Silcock, Leeds, said anything which retained or retarded the flow of sewage added to its septic condition and its smell. He was one of those who favoured the abolition of the intercepting-trap. The sewer and the drain were all part of the same system, and as every drain contributed its quota towards the smell, so every drain should contribute towards the removal of that smell. The arrangements of inlets and outlets with flaps attached to them was open to grave objection. He had never yet seen anything in the way of a mechanical flap which would maintain itself in proper repair for any time.

Mr. T. de Courcy Meade, Manchester, said the intercepting-trap to-day was not liable to foul if properly laid with the ordinary fall. In Manchester they had thousands of the improved intercepting-traps, and he did not think they had one complaint a week of the stopped interceptors. He thought it was a very dangerous thing to propose the abolition of intercepting-traps, and he entered his protest against it.

Mr. Harpur, Cardiff, said they had open street ventilators, and on the high levels of the town he had introduced automatic flushing-tanks of a capacity of 2,000 gallons, fitted with Austin's porous cells charged with permanganate of potash. By deodorising in this way they killed the stinks and found it an almost instantaneous cure. He strongly recommended the use of these automatic flushing tanks, where similar conditions to Cardiff exist.

Mr. Dawson, Banbury, said he agreed with Mr. Read that ventilation was necessary to provide for the escape of the air displaced by the rising sewage. He considered the closing of street-grids and the putting up of shafts the simplest method of ventilating the sewers.

Mr. Gloyne, London, said he would like to know how far the effect of the water spray would be felt so as to be beneficial in sewers of different sizes. He suggested that the cost of the water could not be "taken at nil" and that the cost of supervision, renewals, and repairs, should be taken into account. His experience was that it is impossible to overcome the sentimental objection on the part of the public to the shafts proposed by Mr. Cross, however great the proof to the professional mind that no sewer gas escaped from them. He considered aluminium flaps would be as likely to get out of order as mica flaps in practice. He was of opinion that Mr. Cross's proposal was very far from being ready for practical application. Some years ago he fixed half a dozen of the apparatus described by Mr. Caink at Eastbourne, and he had no complaints afterwards respecting the particular manholes in which they were placed. An objection to the arrangement was that it could not be fixed in shallow sewers. As long as the "Model" by-laws were in force the abolition of the intercepting trap as proposed by Mr. Read was practically impossible. He hoped that Mr. Steele would give the Association the benefits of the experiments being carried out at Bristol when they were complete. He would like to ask why it was considered necessary to ventilate house drains at Bristol and not sewers, and suggested

that the practice from this point of view appeared inconsistent. His suggestion was that the goal to be aimed at in ventilation was a "breathing" action with filtration or deodorisation of the "breath" exhaled. He thought Mr. Caink was working in the right direction but that his apparatus was too complicated. He suggested the following resolution:—"That this meeting requests the Council of the Association to approach the Society of Medical Officers of Health with a view to taking steps jointly with them for carrying out experiments, tabulating returns, and issuing reports towards endeavouring to obtain a satisfactory solution of the question of sewer ventilation."

Mr. Harrison, Birkenhead, said he had carried out experiments with a view to discovering the action of so-called fresh-air inlets to house drains. In each case the ventilating shaft was above the eaves but below the ridge of the property. He found that the so-called fresh-air inlet sometimes acted as an inlet and sometimes as an outlet, according to the direction of the wind.

Mr. Dickinson, Thame, stated that he had carried out numerous experiments and had come to the conclusion that the intercepting trap of the house drain should be abandoned, and that sewers and drains should be dealt with as component parts of one system. He would also abolish the so-called "air-inlet," whether near the surface grids in streets, and ventilate through the "outlet" ventilators on house drains, which he suggested should be carried up to a safe height.

Mr. Watts, Bishop's Stortford, said that the "Liermur" pneumatic system of sewerage had been recently installed in his district and was working satisfactorily.

Mr. Hull, Coventry, agreed with Mr. Smith that sewers could not be ventilated by natural means, but that proper ventilation could only be accomplished on a plenum system. He considered 4½ parts of C^2O_2 per 10,000, mentioned by Mr. Smith, impossible of fulfilment, but said no harm would ensue in admitting 8 parts of 10,000 into the free air.

Mr. Rodwell, Skipton (Rural), said, owing to complaints respecting smells from open gratings in streets, he had fixed four Webb sewer gas lamps and had closed all gratings within a radius of a quarter of a mile. The complaints had now ceased. Some might attribute the remedy as a result of blocking up the manholes and grates, but as a proof that the lamps were doing good work, it was found upon a night inspection that there was a marked absence of smell upon entering the sewers. In some parts of his district the street gratings were closed and the sewers ventilated through shafts fixed to houses, and in these districts there was no complaint of smells.

Mr. Mallinson, Skipton (Urban), said that although the "Model" by-laws of the Local Government Board had been adopted by his council, the intercepting-trap required under the by-law was not insisted upon, and the public sewers were ventilated through the house drains. The system did not appear altogether satisfactory, and he considered that some mechanical means were necessary to properly deal with the volume of sewer gas in sewers. He had one of Webb's Sewer Gas Lamps fixed, which was satisfactory.

During the afternoon the members were entertained to tea by the Lord Mayor of Birmingham.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting on the 4th inst., Mr. Herbert Jones in the chair, Mr. Alfred C. Fryer read a paper on "Fonts," with representations of Baptism and the Holy Eucharist, which was illustrated by lantern slides. 1. *The Baptism of Christ.*—The treatment of this scene on English fonts follows the account given in the gospels, although it has been pointed out that the succession of events are depicted as all occurring at the same moment. Thus we find the Holy Spirit is descending as the dove while our Lord is being baptised by St. John the Baptist, instead of after he has come out of the river Jordan. Accessories not mentioned in Holy Scripture are added, such as angels holding the tunic of Christ, and trees which are possibly intended to personify the Jordan. On the rune-inscribed font at Bridekirk, Cumberland, the Jordan is rising up in a heap, which some authorities believe was intended to symbolise the water going forward to meet our Lord, while others consider it is thus depicted in order to give the idea of perspective. On the font at Castle Frome, Herefordshire, the Jordan is represented by circular lines, and Christ, who is undraped, with His hands placed on His breast, stands up to his waist in the water, while the artist has depicted four fish swimming about—two on either side of our Lord. St. John the Baptist, with a maniple on his right arm, stands on one side of the stream and places his hand on the head of the Saviour. The First Person of the Blessed Trinity is shown as the Hand, or *Dextera Dei*, giving the benediction, and the Third as the Dove. Thus all Three Persons of the Blessed Trinity are represented on the sculpture of the Castle Frome font as being present at the baptism of Christ. This is a most unusual arrangement, as in art we do not often find more than two are portrayed. One of the exceptions is on the font at Gresham, Norfolk, where all the Three Persons are depicted by the artist who sculptured it; while another exception is met with on the font at Southfleet, in Kent. The Saviour is always represented undraped and standing in the river Jordan up to His waist. His hands are at His side at Bridekirk, Wansford, and in other representations. Sometimes His hands are crossed on His breast, as at Grantham; sometimes they are raised in benediction, as at St. Nicholas, Brighton; and sometimes they are extended in the ancient attitude of prayer, as at Lenton, Nottinghamshire. St. John the Baptist is generally portrayed in his raiment of camel's hair, and at Southfleet the head of the camel is actually adorning the lower part of his garment. At Shorne he has a long gown, with sleeves; and at St. Nicholas, Brighton, we find him vested in alb and girdle, holding a round-shaped vessel, which is, doubtless, a chrismatory, and a napkin on a rudary. At Sloley he pours water out of a round bowl on the head of Christ; at West Haddon he holds an open book; and at Grantham, Gresham, and other places he kneels upon a rock. 2. *The Rite of Baptism* is usually represented by a priest immersing an infant or a grown-up person in a font. The sculpture on the fonts at Darenth, Fincham, and Thorpe Salvin were described, and mention was made of twenty-seven representations which are met with in Kent, Norfolk, Somerset, and Suffolk, on fifteenth century octagonal fonts. The various problems surrounding the sculpture on the Kirkburn font were discussed, and details of the three figures on the pedestal of the Upton font (Norfolk) were given. These represent three sponsors (two women and one man) dressed in the lay costume of the fourteenth century. The god-father and one god-mother hold rosaries in their hands, while the other god-mother carries the infant in swadling bands. The date of the font is most likely A.D. 1380, and it was doubtless erected by the contemporary Lord of the Manor of Upton, John Botetourt or Buttetourt, as a memorial of the baptism of his only daughter and heiress, Jocosa, who is doubtless the infant represented in her godmother's arms. 3. *The Last Supper.*—We have in England two representations of the last supper as ornamentation on two fonts dating from the twelfth century. In both cases a long, straight table is employed. At North Grimston (Yorkshire) the sculpture is over 10 ft. in length Christ is seated in the centre and six Apostles are placed on either side. Considering the Last Supper from an artistic point of view, Mrs. Jameson reminds us that there is great difficulty in dealing with this subject in consequence of the number of figures and the monotonous and commonplace character, materially speaking, of their occupation. This difficulty evidently presented itself to the artist employed on the Norman font in St. Nicholas's Church, Brighton, and consequently he only introduced our Lord and six of the Apostles. 4. *The Holy Eucharist.* — On twenty-one fifteenth-century fonts in Kent, Norfolk, Somerset, and Suffolk the representation of the Holy Eucharist is represented at the moment when the priest, robed in Eucharistic vestments, stands before the altar in the act of elevating either the chalice or the sacred Host. At Great Glemham and Woodbridge in Suffolk the priest, however, has left the altar and has turned towards a man and woman in order to communicate them. In both instances the priest is simply vested in alb and crossed stole, while the communicants hold the houseling-cloth before them. The sculpture depicts the ladies in the butterfly head-dress of the date 1483, which betokened a lady of rank. The interesting representations of the Holy Eucharist on the fonts at Shorne and Southfleet, in Kent, were described, and the fonts at Sutton and Tuddenham St. Martin were mentioned as containing statues round the pedestals. These statues represent the celebrant and attendants at the celebration of the Holy Eucharist. At Tuddenham St. Martin the celebrant is not vested in a chasuble, but in a cope fastened with an ornamented morse, and one of the assistant ministers carries over his arm a long cloth, which is possibly intended for the sudarium. Mr. R. Garraway Rice, Mr. Mill Stephenson, Miss Grafton, and the Chairman took part in the discussion.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held on the 4th inst., Mr. C. H. Compton, V.P., in the chair. The chairman read a paper on the Castle of Dunstanborough, situated on the East Coast of Northumberland two miles north of Honick and about ten miles south of Bamborough, with which it was confused in some of the early chronicles. The castle and manor was the seat and estate of Edmund, Earl of Lancaster, a younger son of Henry III., and devolved to his son and heir Thomas, who in the ninth year of Edward II. converted the manor house into the castle. Earl Thomas was the premier noble of the English Baronage, and headed the confederated Barons against the King for the expulsion of Piers Gaveston and the Spensers. He was defeated by the King's troops near Borough Bridge, and taken prisoner to Pontefract, where he was tried and executed. His brother Henry subsequently obtained restitution of the estates, including the Castle, which afterwards devolved upon John of Gaunt, who married Blanche, grand-daughter of Earl Henry. The Castle continued in the Lancastrian family till the reign of Henry VI, and was captured by the Yorkists after the battle of Hexham. It changed owners more than once during the wars of the Roses. It is described in the year 1550, fifth of Edward VI., as in wonderful great decay. It appears to have belonged to the Crown in the tenth of Elizabeth, and was granted on February 6, twenty-second of James I., to Sir William Grey, Baron of Wark, and afterwards became the property of the Earl of Tankerville, in whose family it remained until recent times.—Mr. R. H. Foster brought a large number of beautiful photographs, taken by himself, to illustrate the paper; and Mr. Gould, Mr. Price Stretche, Mr. Forster, Mr. Patrick, and others took part in the discussion which followed.

Illustrations.

DESIGN FOR A TOWN CHURCH.

WE have devoted our illustration plates this week to the design for a town church which has gained the Soane Medallion at the Institute. There have not been many occasions, of late years, on which we should have felt justified in giving so prominent a place to the winning design, for during a good many recent years the designs sent in for the Soane have been disappointing and below the mark of former years. This year, however, the medal has been well contested; the designs sent in show a high average of ability, and the one by Mr. E. F. Reynolds, to which the medal has been awarded, was unquestionably the best in regard to general architectural power and the careful study of detail; the perspective is one of the finest architectural drawings we have seen for some time.

The position of the choir seats is, of course, quite wrong, both for ritualistic and practical reasons; but to some extent the instructions to competitors are to blame for that.

The author has sent us the following notes as to his intentions in the design:—

"In the conditions for the design for a Town Church issued by the R.I.B.A., competitors were referred to certain remarks by the former President, Mr. Emerson, as to the unsuitability to modern worship of the mediæval plan, with its altar removed from the congregation by the extreme length of the chancel; and as to the possibility of reverting in some degree to the type of the Early Christian church, with its altar placed in a shallow apse close to, and in full view of, the people.

It was evidently intended that this sugges-

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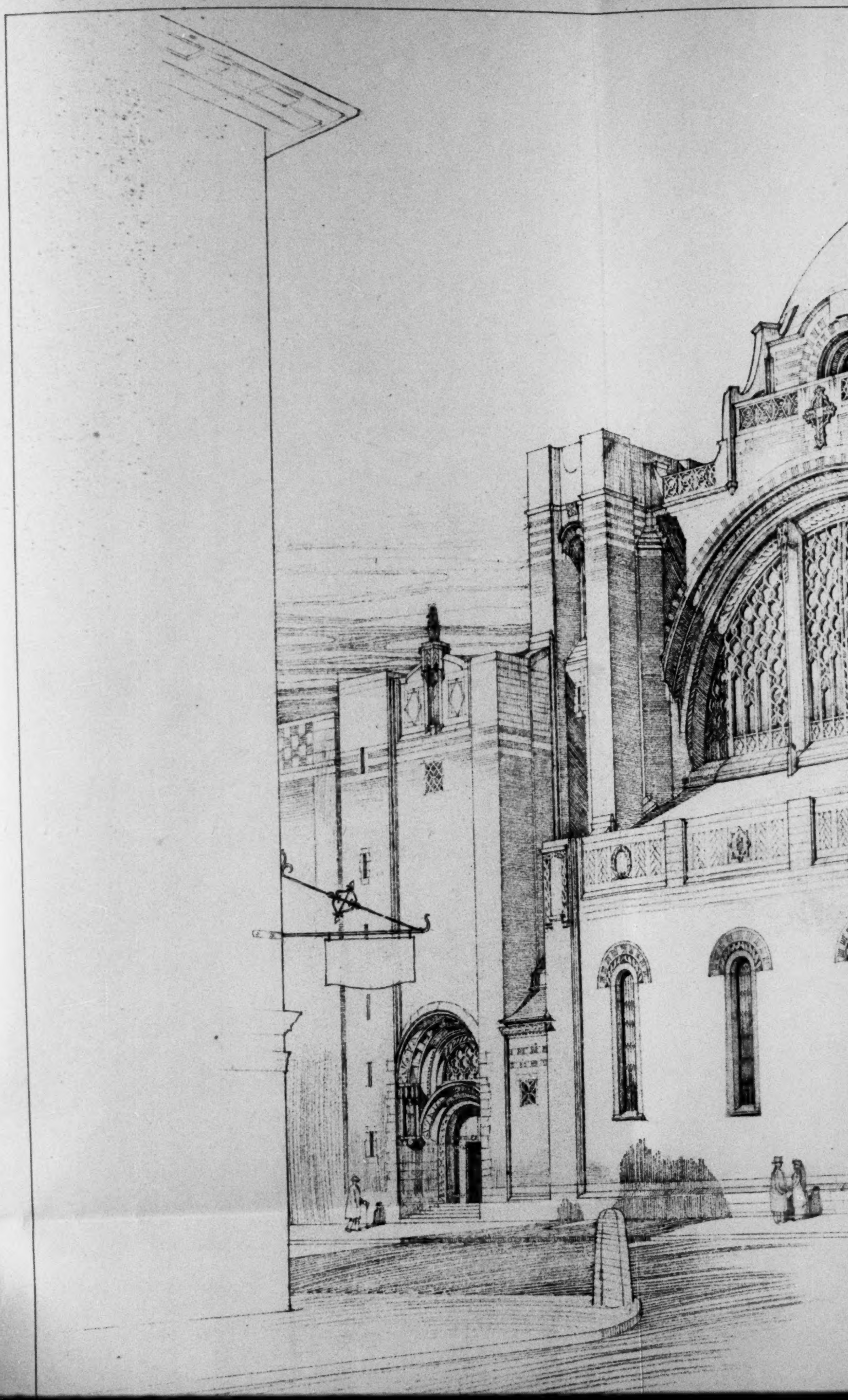
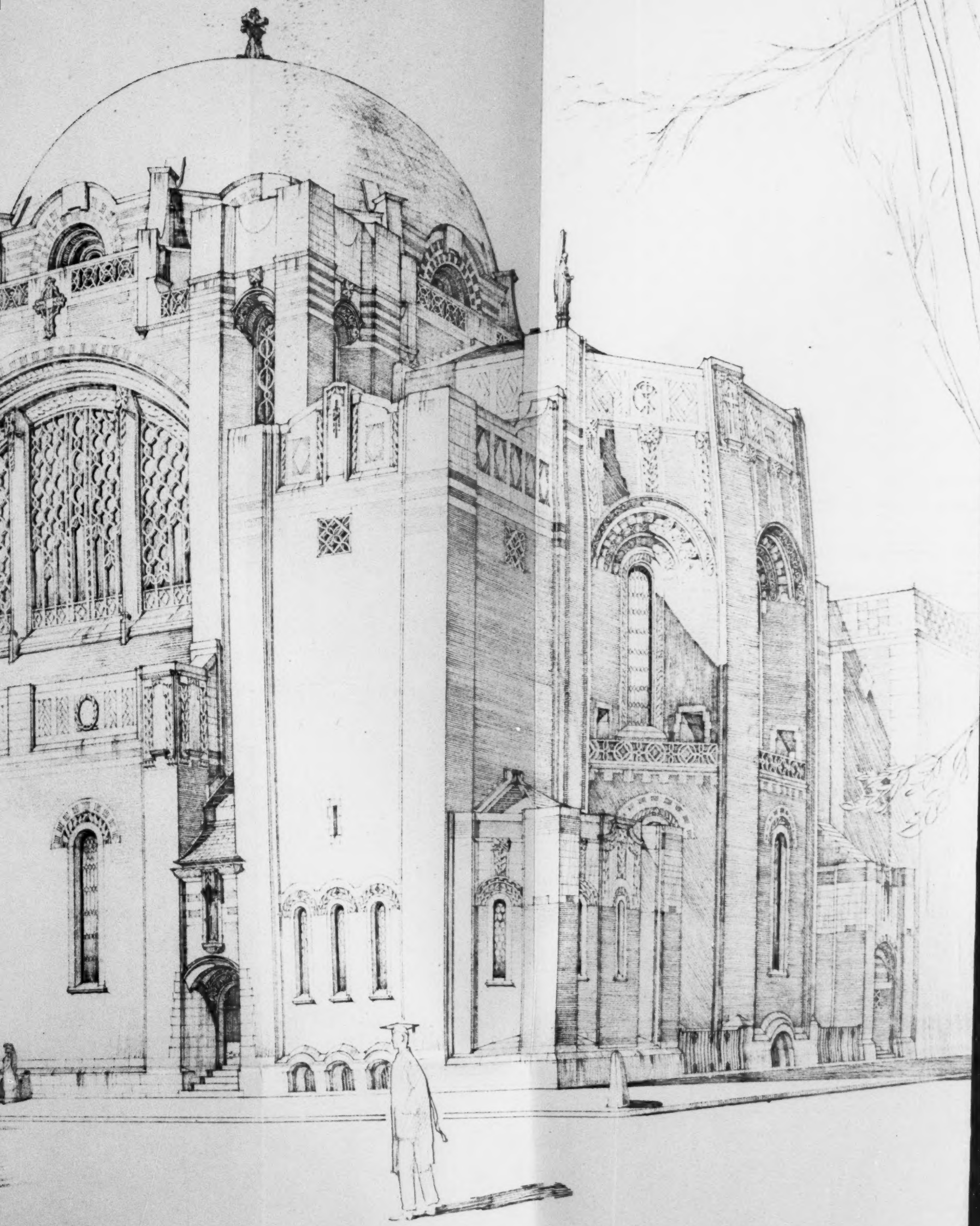
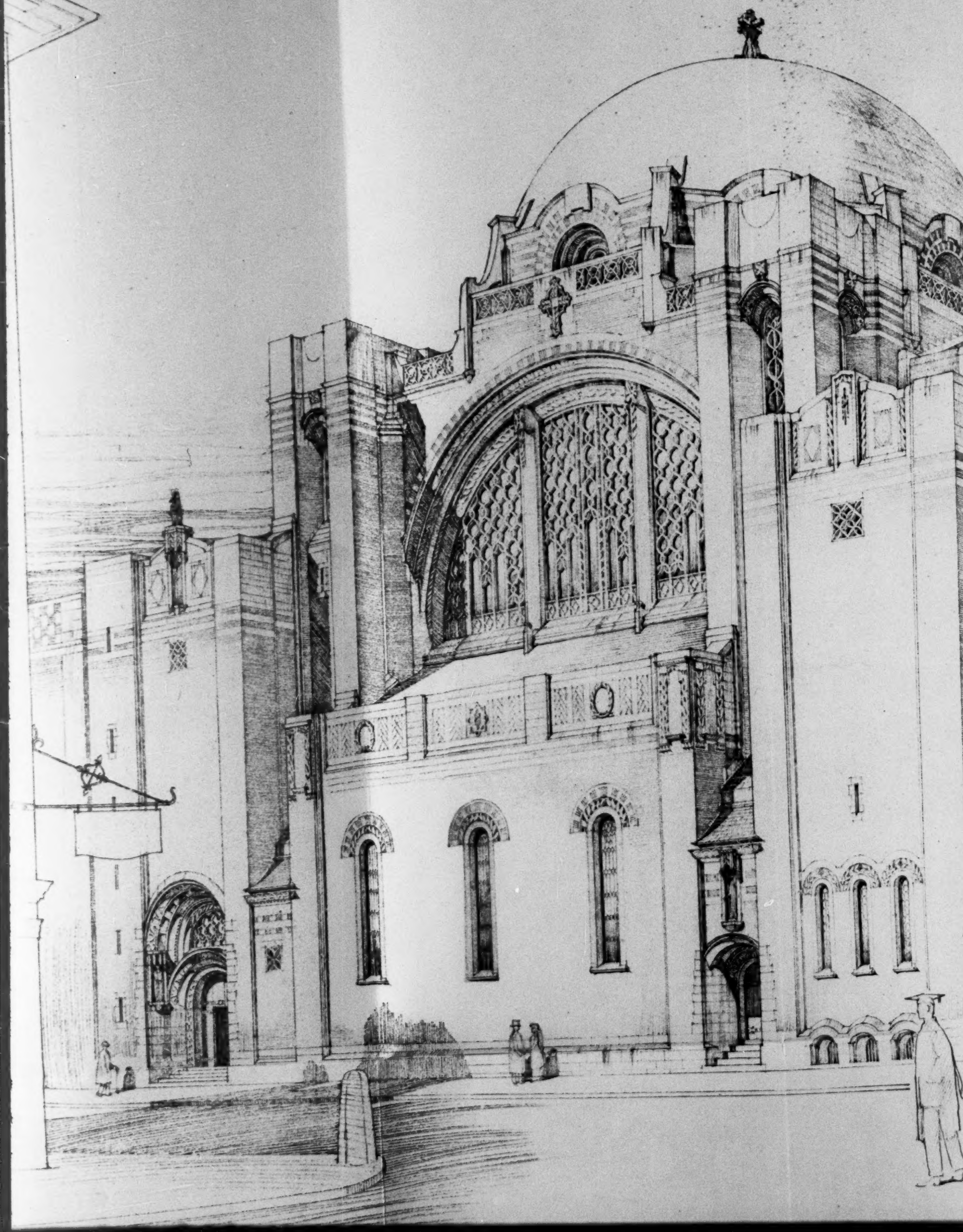
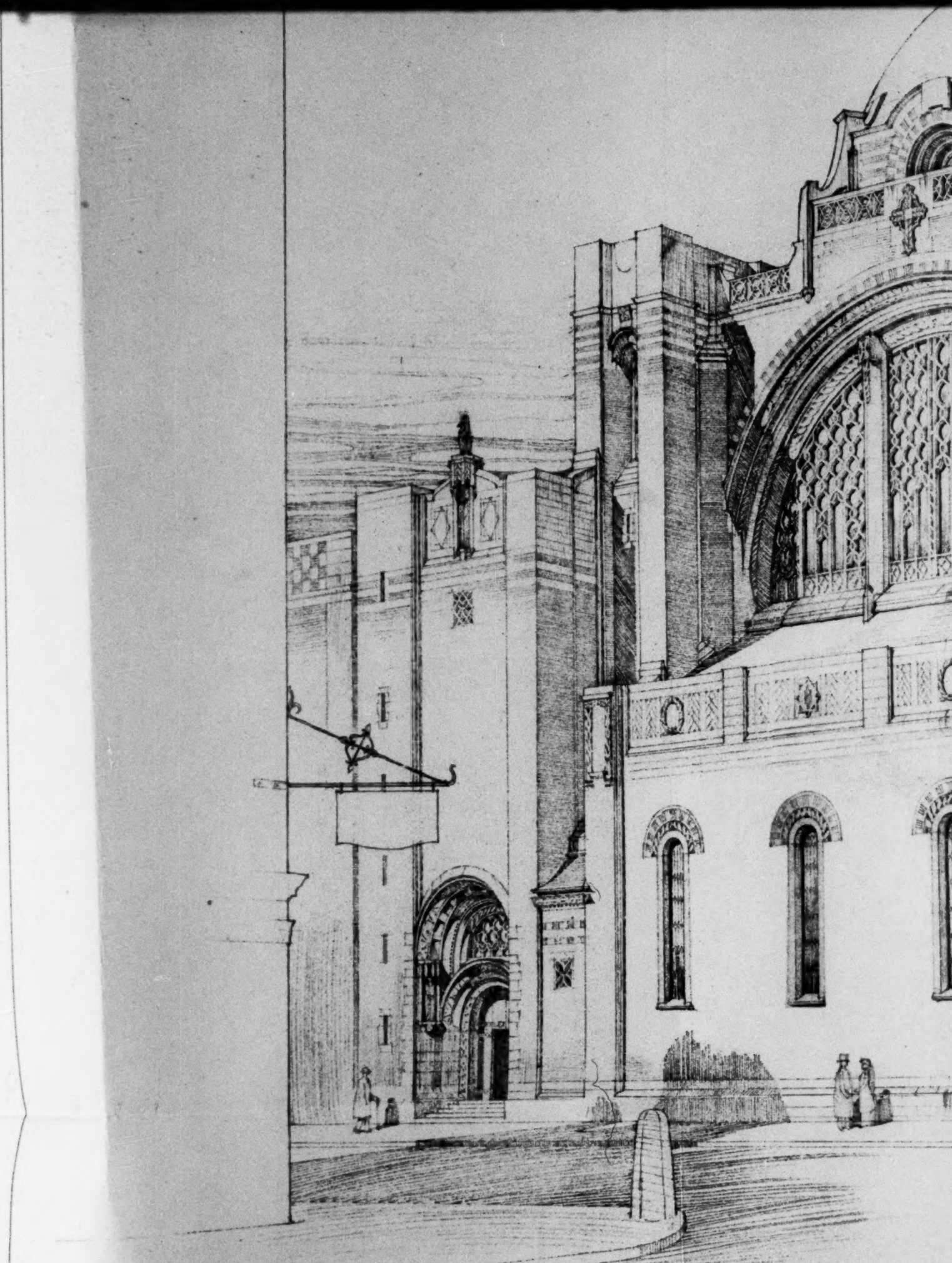
SOANE MUSEUM. E. F. REYNOLDS.







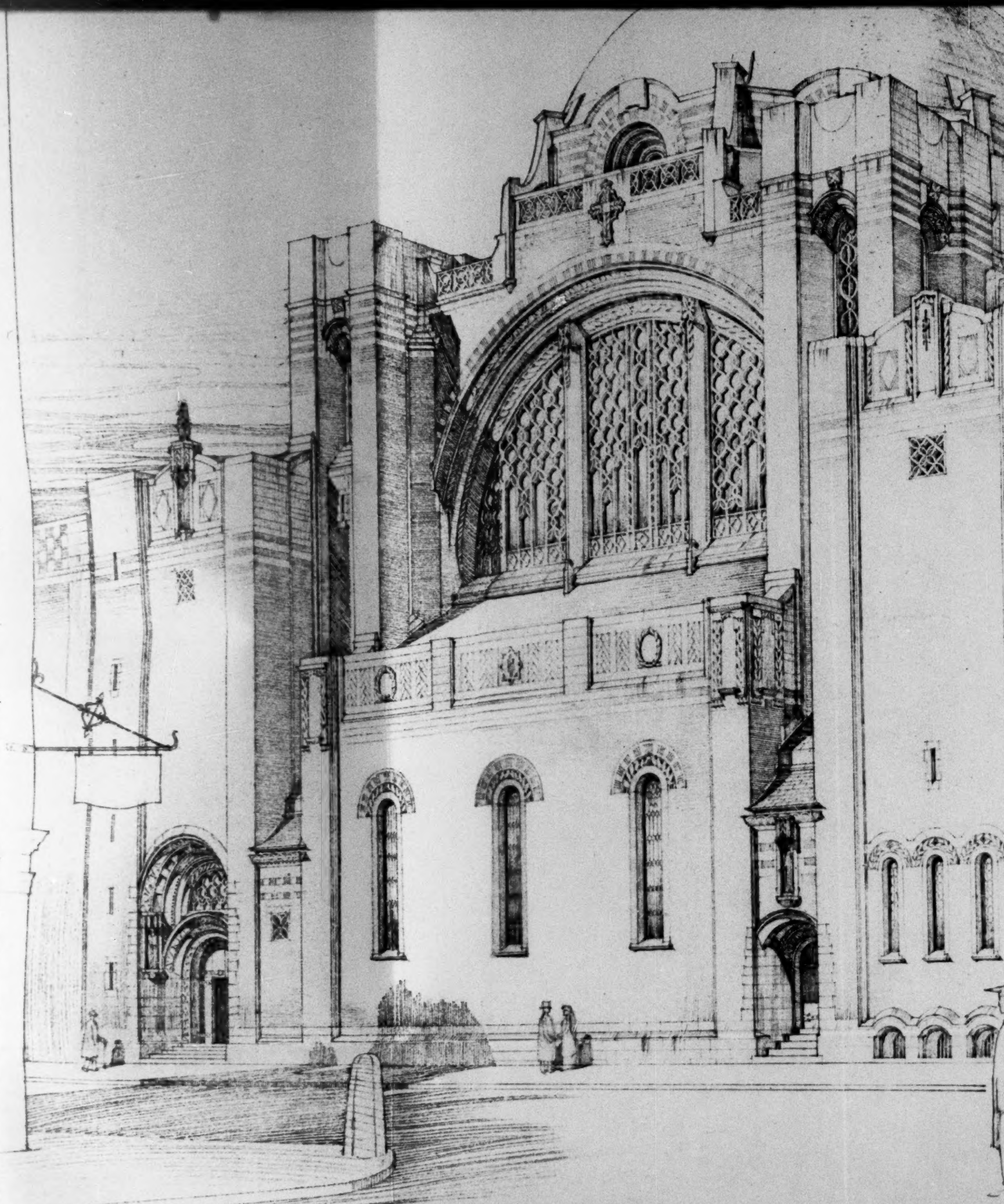


The PERSPECTIVE *View*

Soane Medallion, R. I. B. A., 1903.

DESIGN FOR A TOWN CHURCH.—By Mr. E. F. Reynolds.

PERSPECTIVE VIEW.



PECTIVE *View*

DESIGN FOR A TOWN CHURCH.—By Mr. E.

PERSPECTIVE VIEW.

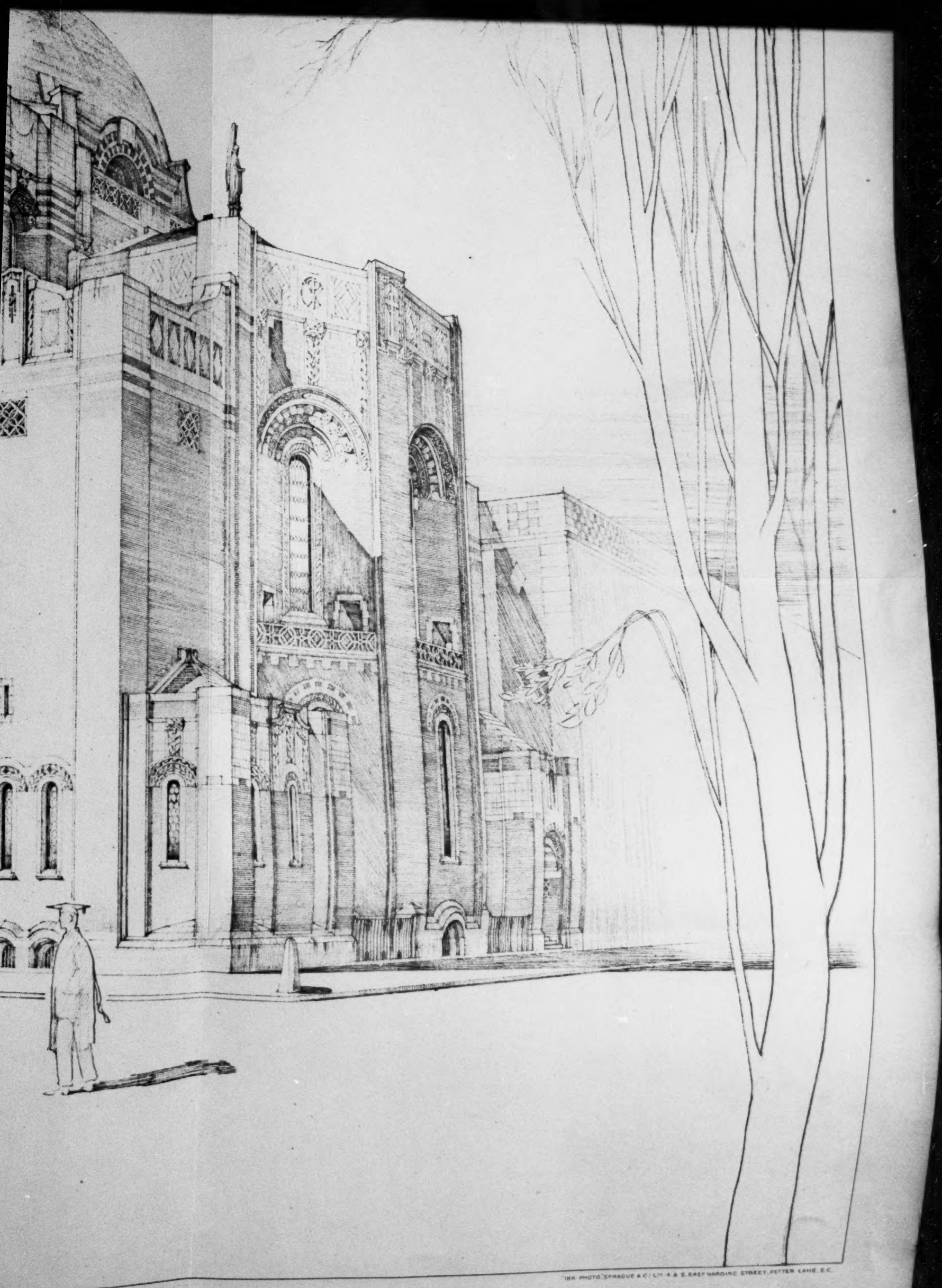


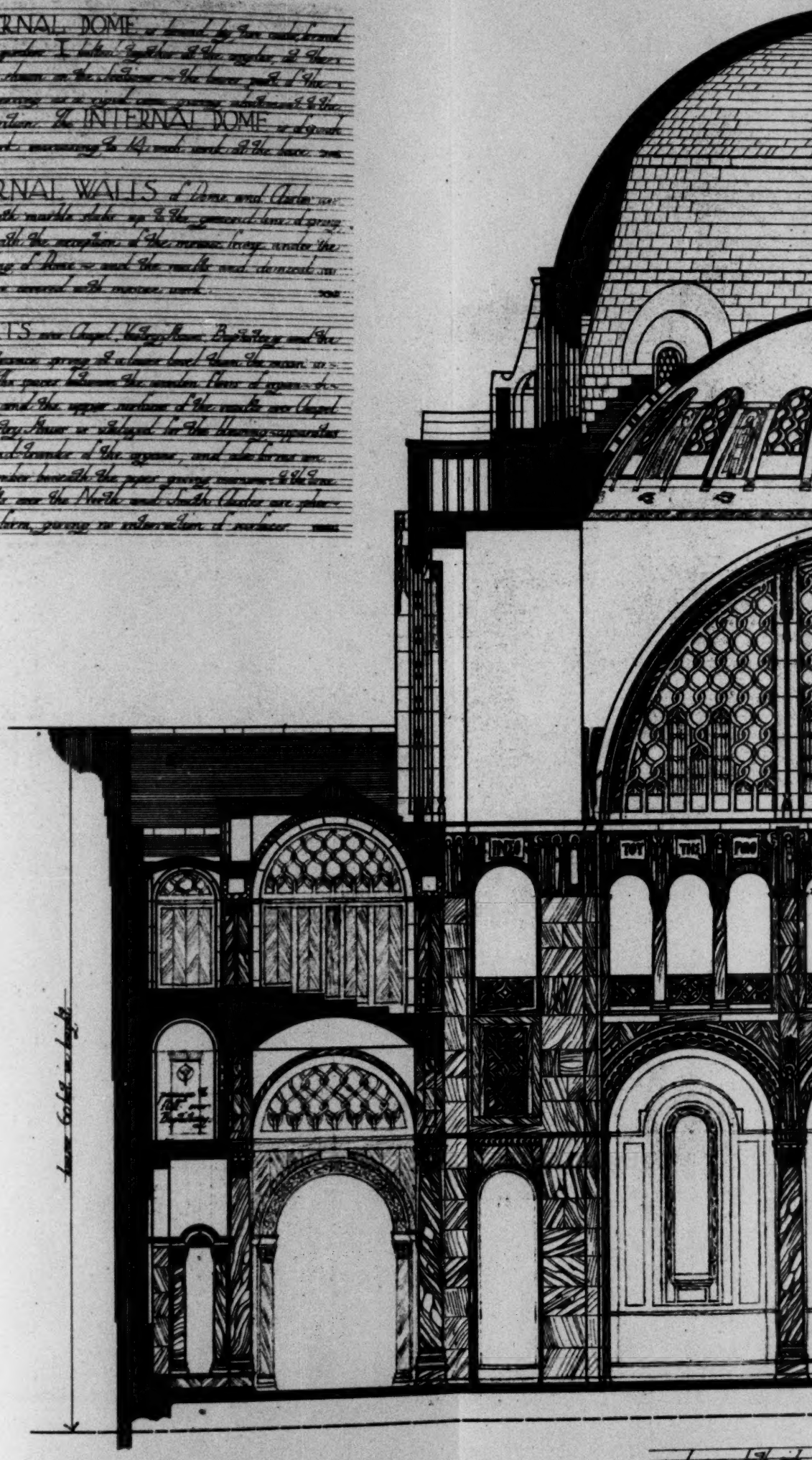
PHOTO-LITH. SPRAGUE & C°. LIM. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

MR. E. F. REYNOLDS.

The EXTERNAL DOME is formed of fine wrought steel garden [illegible] bolted together at the angles, & the heights shown on the Section. The lower part of the dome, springing out as a cornice, forms a gallery round the upper portion. The INTERNAL DOME is of plaster, [illegible] measuring 74 feet wide on the base.

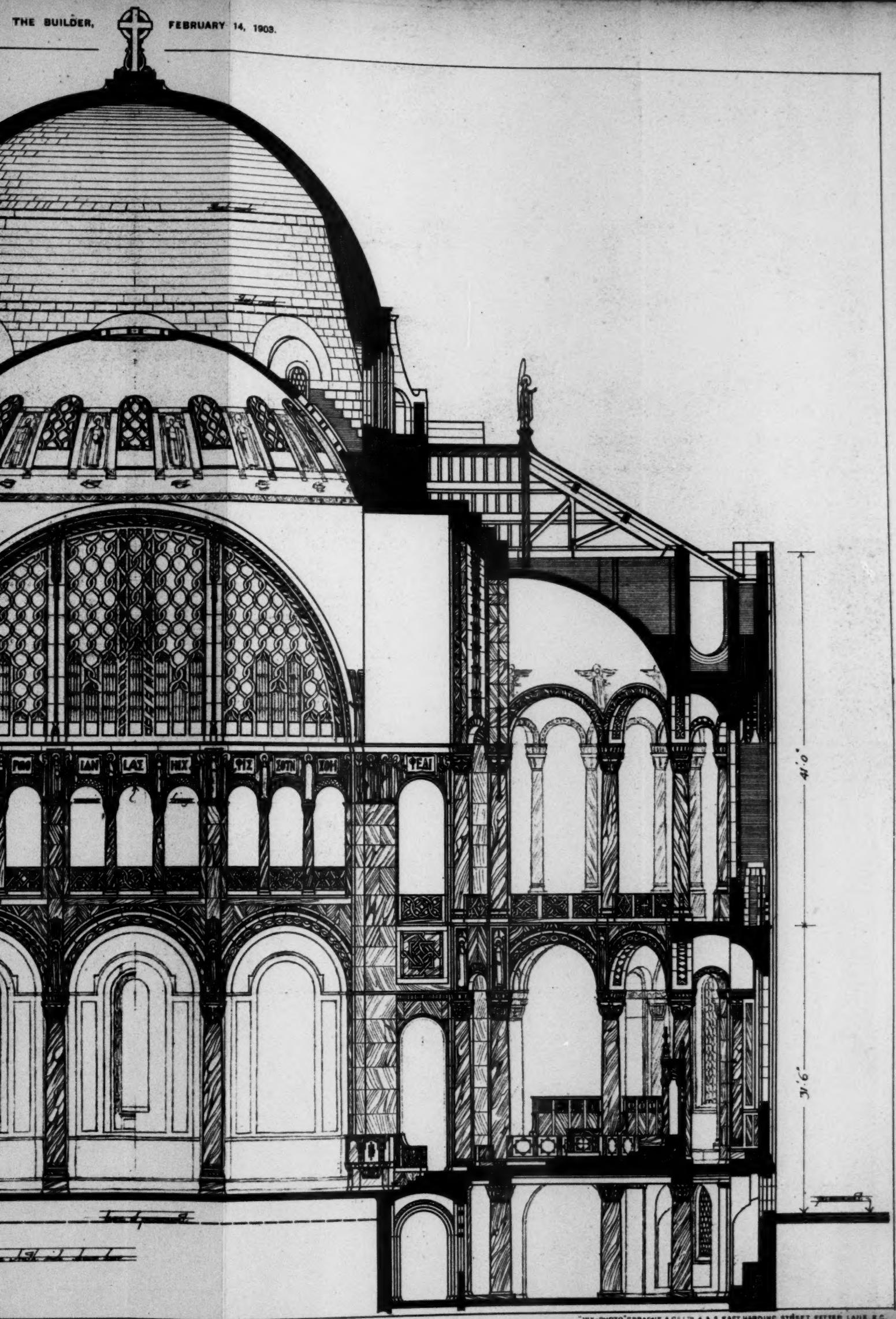
The INTERNAL WALLS of Dome and Choir are lined with marble slabs up to the [illegible] springing, with the exception of the narrow facing under the passages of Dome [illegible] and the marble and domical [illegible] are covered with mosaic work.

The VAULTS over Chapel, Vestry, Choir, Baptistery and the West Entrance, spring at a lower level than the main vaults. The spaces between the wooden floors of upper & lower and the upper surface of the marble over Chapel and Vestry Floor are occupied by the Heating apparatus and warm chamber of the system, and also forms an air chamber between the space forming basement & the floor. The vaults over the North and South Choir aisles are plain and uniform, giving an intermediate [illegible]



Soane Medallion, R.I.B.A., 1903.

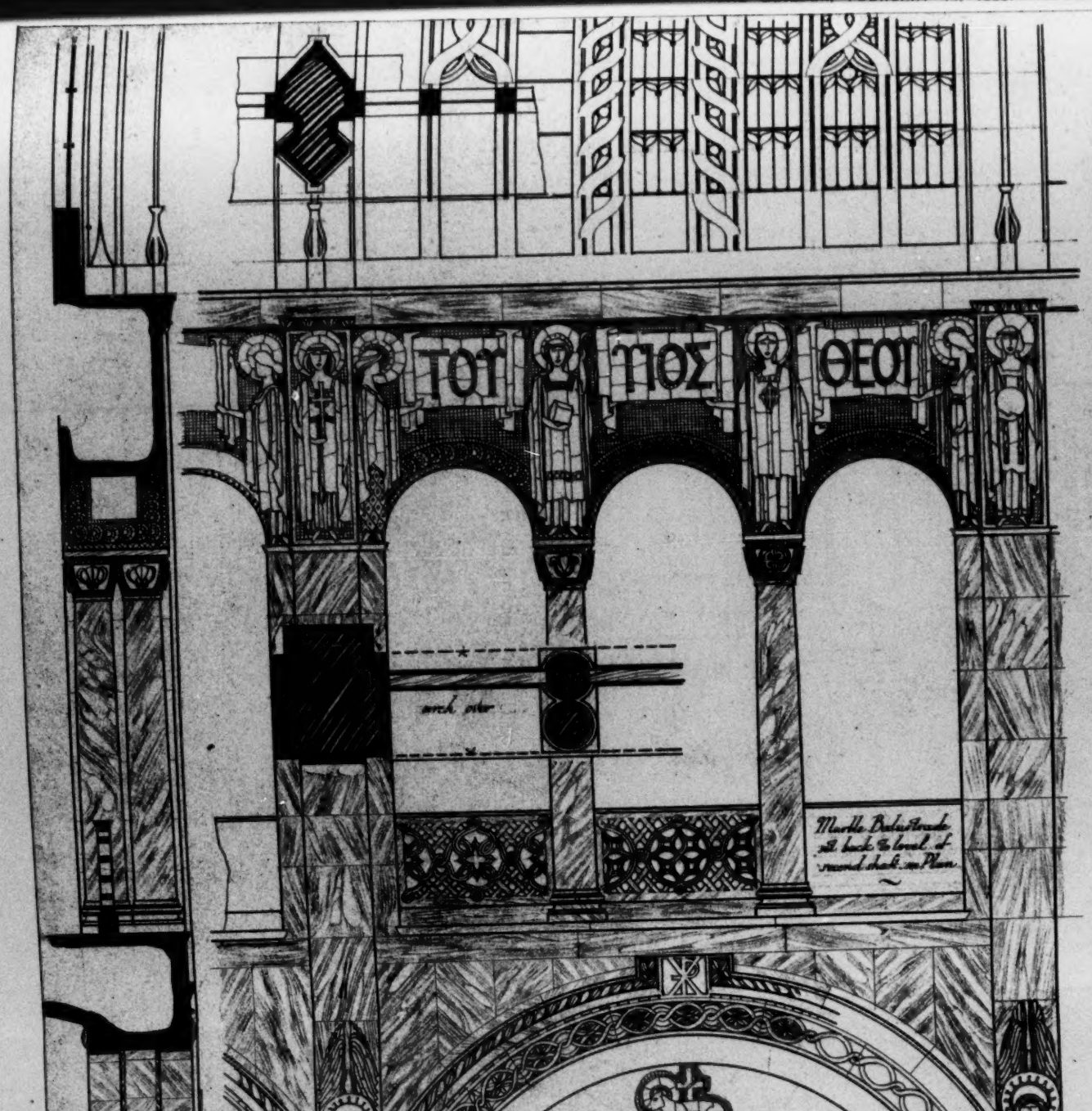
DESIGN FOR A TOW



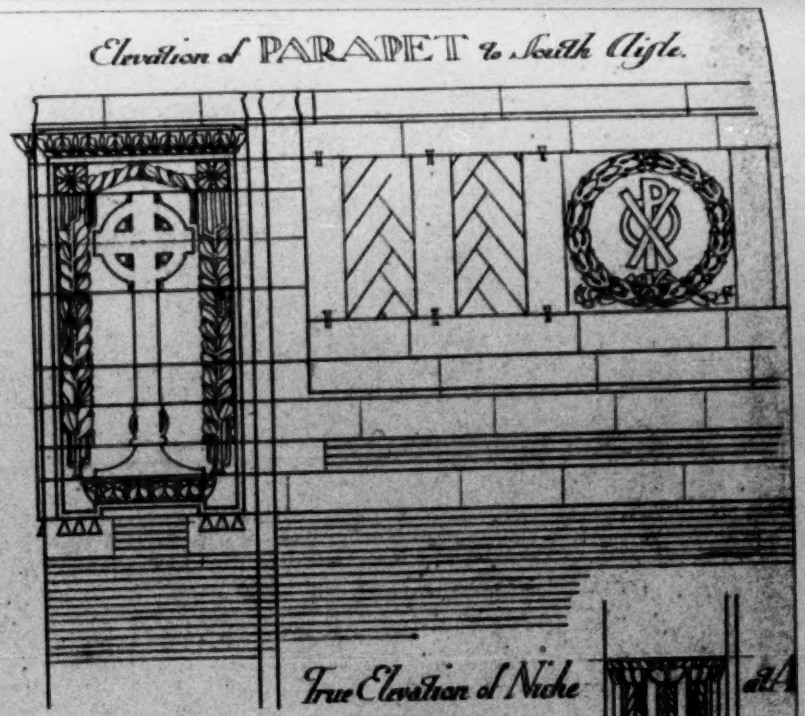
"INK-PHOTO," SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

FOR A TOWN CHURCH.—By Mr. E. F. Reynolds.

SECTION.

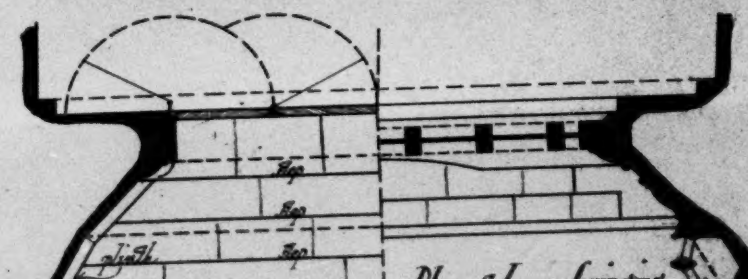


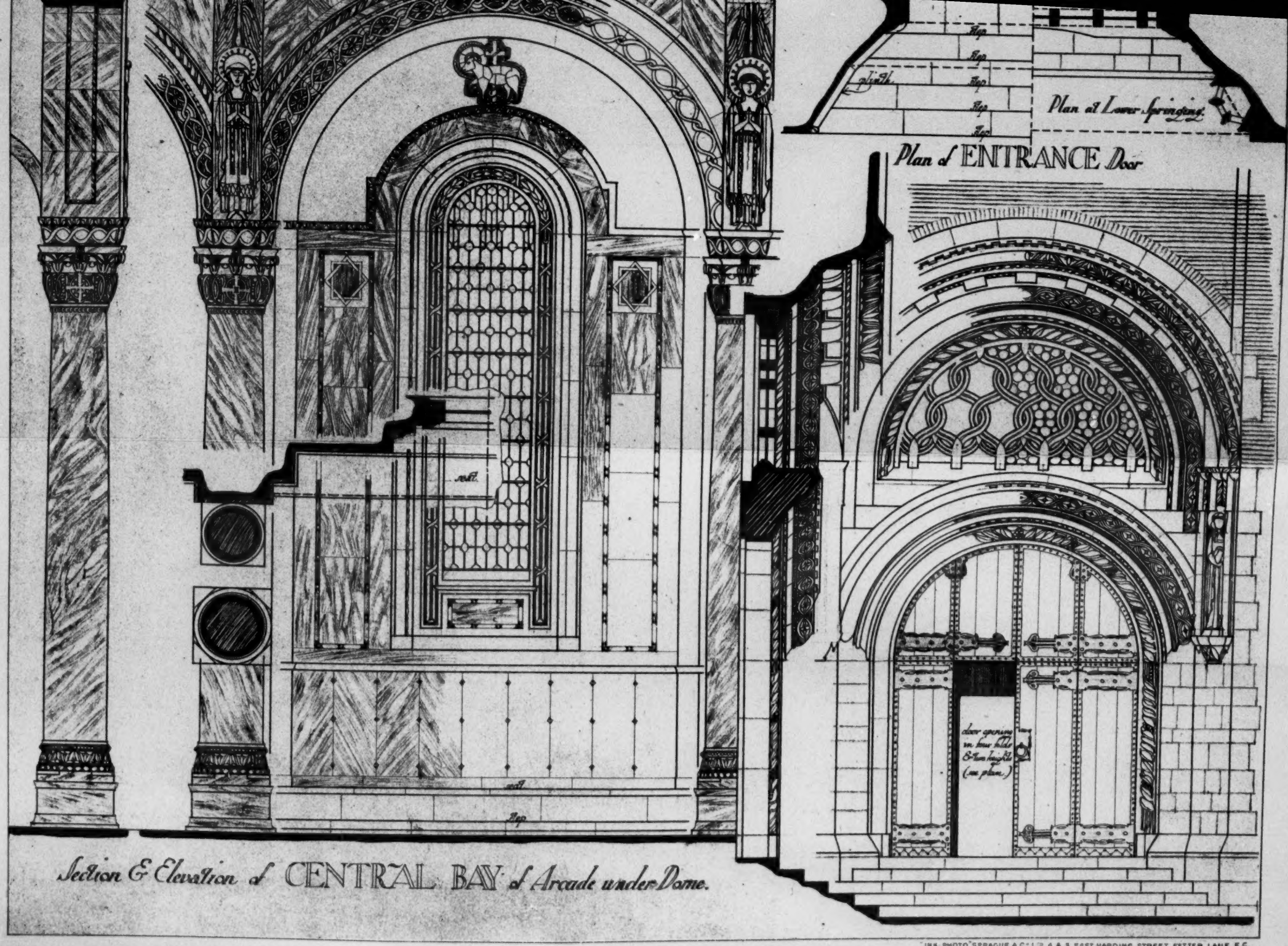
Elevation of PARAPET to South Aisle.



True Elevation of Niche

Panel over East End ~ Windows & Gables. &c





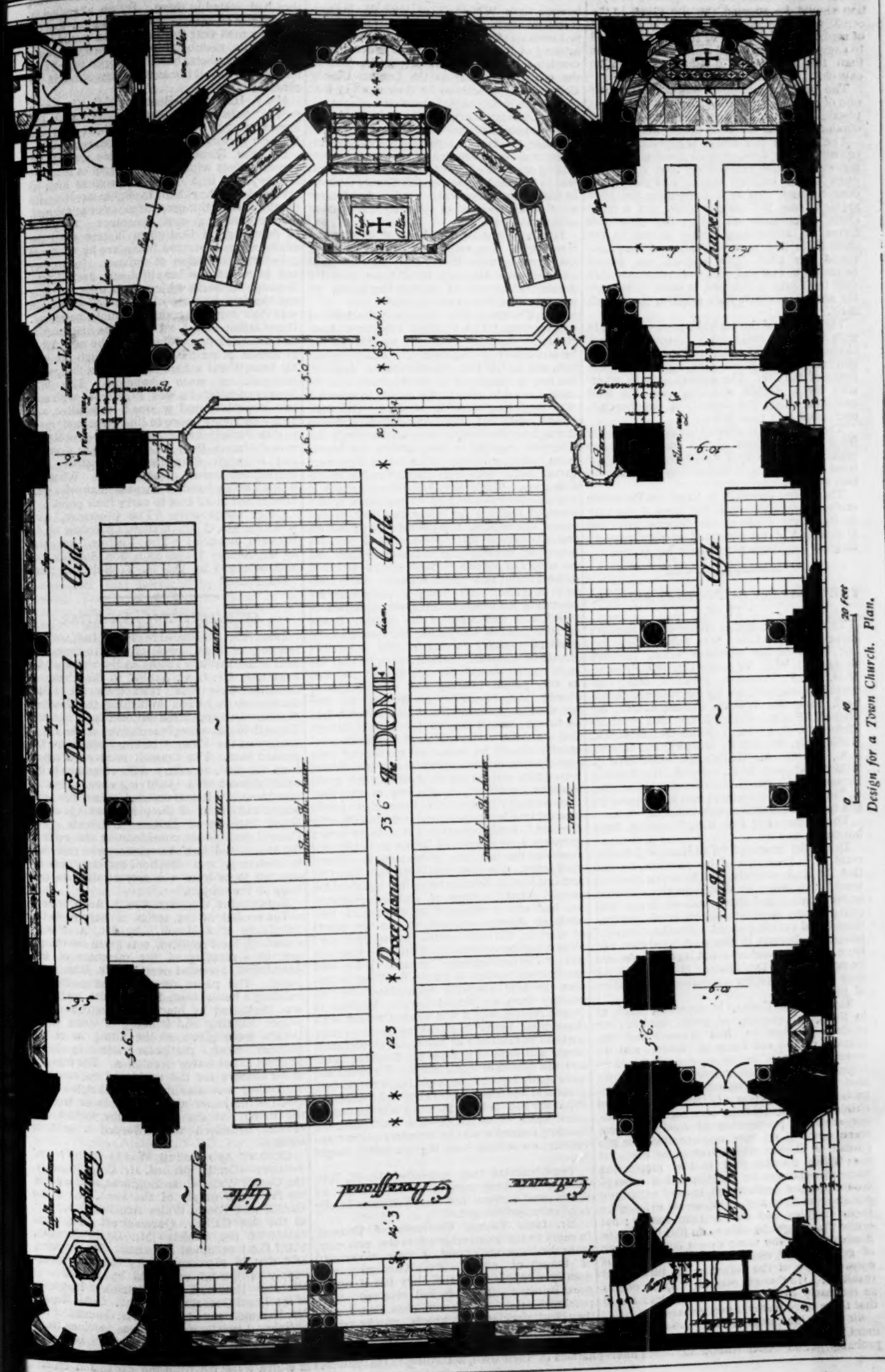
Section & Elevation of CENTRAL BAY *of Arcade under Dome.*

INK PHOTO. SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

Soane Medallion, R. I. B. A., 1908.

DESIGN FOR A TOWN CHURCH.—By Mr. E. F. Reynolds.

DETAILS.



Design for a Town Church. Plan.

tion should be adopted, the site given in the conditions being too short to allow of a chancel of mediæval depth; and its shape also seemed to suggest a plan based on the square rather than the longitudinal divisions of a gothic church.

The problem presented was thus primarily one of planning, and its difficulties were complicated by the condition that light could be obtained only on two sides of the site.

The plan of this design is grouped round a square central area, secured constructively by means of arches abutting on four compound piers at the external angles, and carrying a double dome. An apse containing the altar springs from the eastern piers, and a semicircle of columns set within the main wall forms an ambulatory giving access to the choir-stalls and a concentration of emphasis round the altar. The vestries are placed beneath the east end, and the organ chambers over the flanks of the apse, in order to increase the area of available floor space in the church itself.

Three sides of the central square are filled in with arcades in two heights, above which semicircular clearstory windows between the pendentives of the dome give light within the limits of the site. The western gallery, accessible by a double staircase from the west entrance, brings the capacity of the church to somewhat over 1,000 seats.

The exterior was allowed to develop naturally from the conditions of the design, and any architectural quality it may have arises rather from the grouping of masses than the elaboration of parts.

The design generally is based on Byzantine methods, modified—as in the cases of the very un-Byzantine depth of the external piers and arches, and of the increased window-area—to English conditions and climate."

THE SANITARY INSPECTORS' ASSOCIATION.

THE twentieth annual dinner of the Sanitary Inspectors' Association was held on Saturday last week in the Venetian Salon, Holborn Restaurant, W.C. Sir James Crichton-Browne, M.D., F.R.S., President, presided, being supported, amongst others, by Sir William Broadbent, Bart., Sir William Collins, L.C.C., Sir Michael Foster, M.P., F.R.S., Sir William Richmond, R.A., Dr. T. Bulstrode. M.A., Dr. Hellier, Dr. Shirley F. Murphy, Dr. Groves, B.A., Dr. B. A. Whitelegge, Alderman J. Milsom Rhodes, M.D., Mr. J. H. Balfour-Browne, K.C., Mr. G. L. Gomme, L.C.C., Mr. E. Tidman (hon. Secretary), and several mayors and town clerks of Borough Councils.

The toast of "The King" having been honoured,

Dr. Hillier proposed "The Houses of Parliament." In the course of his remarks, he said that Dr. Koch recently told him that the time would come when we should get all pestilences under control, and there was no doubt that past progress in public health would be continued, and even increased. For the control of infectious diseases in the past legislation had been necessary, and no doubt legislation would be necessary in the future. He thought the time had come for the compulsory notification of phthisis.

Sir Michael Foster, in response, said, as to the great question of public health, our modern civilisation had transformed the balance of the old force of Nature, and we were making for ourselves a new world, in which while we had greater advantages we also had greater dangers. Our rapid locomotion, our collection of large numbers of children in big schools, our big assemblies, our scientific preparation of food—all these were opening up new opportunities for the spread of disease which had to be met. It was quite possible that in the future the bacterial processes for the disposal of sewage would produce fluids which, instead of making our streams dirty and filthy, would even make them brighter and clearer than before; but while they might be able to do that they were discharging at the same time a large number of germs, and it was a matter for the serious consideration of the future what this would result in. He thought one might speak of this as the early bacteria era, for we had found that there were bacteria everywhere.

Sir W. Collins, in proposing "Local Government," said that local governing bodies would probably get on better without too much interference from Whitehall, or without bureaucratic management. Local Government was, to a certain extent, under a ban, but if municipal housing of the people was to be denounced as municipal trading, he was prepared to take up the challenge so far as the London County Council were concerned, for their work in that respect could be justified anywhere.

Mr. Laurence Gomme, in reply, said that what a public official would consider, in one sentence, an ideal arrangement of local government, was—a committee of imaginative men setting practical officers to work, and that ideal was to be found in the London County Council. In his opinion there was a need in London for a sort of endowment of research in connexion with sanitary science.

Mr. C. Fleetwood Pritchard, M.A., Mayor of Hampstead, also responded, and referred to the great growth there had been in local government. Although we did not care for the individual visit of sanitary inspectors, yet we welcomed their work generally.

The Chairman then submitted the toast of the evening, "The Sanitary Inspectors' Association." As their President, he said he felt he was a sort of inspector of sanitary inspectors, and he felt that the Association deserved the hearty allegiance of its members, and the careful consideration of the public, to whom it was rendering valuable services. The individual units of the Association scattered throughout the country were unobtrusively but diligently engaged in safeguarding our homes from insidious dangers from which they were threatened in these overcrowded and adulterative days. While the Association helped to promote the efficiency of its members, it also afforded facilities for advancing their professional interests in a legitimate way; indeed, the Association seemed essential if sanitary inspectors were to have justice done them and be rendered secure in their tenure of office against social and vested interests. The sanitary inspector had many opportunities for educating the public in the great questions of health and well-being of the people. It was for the good of the public not less than the good of sanitary inspectors that inspectors should be adequately remunerated, so that the right men should be appointed; it was to the public interest that the inspector should have security of tenure, so that he should perform his duties without fear or favour, and it was to the public interest that the status of the calling of the sanitary inspector should be raised by permitting their participation in the examination of candidates who desire official certification of their qualifications for office. It was one of the most encouraging signs of the times that public interest was being more and more intelligently directed to health questions; that there was a growing appreciation of health as a national asset—as the one sure prop against national insolvency. He was convinced that the first and last line of defence was the health of the people. But in spite of our complacency, we had still a tremendous amount of preventable disease amongst us. In the words of Carlyle, did not health mean harmony? Was it not the net total of all the good that is in us? "The healthy man," he said, "is the most meritorious product of nature." When sanitation became properly appreciated in this country then we should have a Minister of Public Health, with a seat in the Cabinet and a department under him, taking over a large part of the functions of the Local Government Board and some of those of the Board of Trade and the Board of Agriculture. We were not quite ready for that, perhaps, but it would be a great and admirable step in the right direction. What we had to bear in mind was the economical value of sanitation—the truth that the sanitary inspector was an economy to the community, no matter how big his salary might be.

The Chairman then presented Mr. W. Wilkinson, late Chairman of Council, with an illuminated address, and Mr. Wilkinson briefly acknowledged the gift.

Mr. Isaac Young, Chairman of Council, in reply to the toast, referred to the necessity, from the inspector's point of view, of security of tenure of office. The Association was greatly disappointed—and they felt it was a great injustice—that they had received no representation on the Examination Board, and they had decided that unless proper representation was given them, they would have no alternative but to institute classes and examinations of their own, according to the powers they had vested in them. By an alteration in the articles of association they hoped that by this time next year the Association would have doubled its membership. At present there were 700 members, but they hoped to enrol in the Association all the sanitary inspectors in the country.

Mr. J. H. Balfour-Browne, K.C., then proposed "Science and Art," coupled with the names of Sir William Broadbent and Sir William Richmond, both of whom replied.

Sir Wm. Richmond said there were three considerations which were in front of them:—(1) They had first of all to promote life; (2) art; and (3) they had to fight, as Hercules fought, against the great demons of selfishness, money grubbing, and ignorance. They had to defend great God-given Nature from the adulterations promoted in Nature by what was called the promotion of Science. In art they had to defend the beautiful, and even if their Borough Councils objected to their carrying out the law because of some self interest, it was their duty to report all smoke nuisances. It had fallen to his lot to be the first outsider in London to prosecute under the new Act as to smoke prevention, and although he won his case, it was a hard battle. But things had changed, or were changing. The little Society of which he was President—with only two inspectors and a small committee, and 200*l.*—had done more in this great metropolis to stop the selfishness and money-grubbing of manufacturers than all the County Councils and Borough Councils put together. Big committees were a great mistake. What was wanted was a band of earnest men who were determined at all cost to carry their point.

Other toasts were "The Chairman," proposed by Mr. C. MacMahon, Chairman of the Western Branch; "The Visitors," proposed by Mr. Aubrey Richardson, hon. Solicitor, and acknowledged by Dr. H. T. Bulstrode; and "The Press."

ARCHITECTURAL SOCIETIES.

INSTITUTE OF ARCHITECTS OF IRELAND.—A meeting of the Council of this Institute was held at the Institute rooms on the 2nd inst., the President, Mr. G. C. Ashlin, in the chair. A communication was read from the Ulster Society of Architects informing the Institute that they had appointed Mr. Gilliland and Mr. Fennell to act as representatives of the Ulster Society on the Council of the Institute for the present year. The Council received a report from the hon. secretary with reference to the establishment of a qualifying examination for membership. It was decided to have the usual annual exhibition of the prize drawings of the Royal Institute of British Architects. The Council had under consideration the rules of the Master Builders' Association with reference to tendering, and the hon. secretary was instructed to address a communication to that body on the subject.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The second of the series of lectures on the "Building of a House," by Mr. A. Hunter Crawford, the President, was given on the 4th inst. to a meeting of the members of this Association, presided over by Mr. Charles A. Jockel. The paper described the method of building a house from the asphalte level, and was illustrated by blackboard sketches of the proper building and bonding of stone walls. Details were given of the fitting in of the plumber work, particular attention being directed to hot water circulation. The framing of the timbers for the roofs, and the covering with tiles, was also detailed. Sketches were given of the joiner work and plumber work of the roofs. At the close of the lecture Mr. Hunter Crawford was awarded a vote of thanks.

CARDIFF AND SOUTH WALES ARCHITECTS' SOCIETY.—On the 5th inst. Mr. C. H. Priestley, the Cardiff Waterworks Engineer, read a paper on the water-supply of the town, before the Cardiff and South Wales Architects' Society, at the Art Gallery, Queen-street. The President of the Society (Mr. David Morgan, F.R.I.B.A.) occupied the chair. Mr. Priestley said that in 1850 an inquiry into the water-supply of Cardiff was held by Mr. Thomas Webster Rammell, Superintendent-Inspector of the Local Government Board. In his Report Mr. Rammell stated that at that time water for ordinary domestic purposes was obtained from the Glamorgan Canal, the River Taff, or from a few pumps in different parts of the town, some of which were fed from the canal, and other

by means of wells sunk through the marl strata upon which the upper part of the town is situated. The supply was inefficient and uncertain, and the quality generally much deteriorated from filtrations taking place. It was in that year that the Cardiff Waterworks Co. was formed. Mr. Priestley then described what had taken place since, including the construction of two reservoirs in the Taff Vawr Valley. No. 3 Reservoir, which has yet to be constructed, would, he said, have a capacity of 670 million gallons, and was estimated to cost about 250,000*l*. The capability of the gathering ground in the valley for the collection and storage of water would be understood when he stated that during the two last months over 2,000 million gallons had passed over the waste weir at the Cantref Reservoir. On January 5 there was a depth of 15 in. passing over a sill which was 160 ft. wide, and if the population of the town and district served were doubled in years to come there would be an ample supply in the Taff Vawr Valley for all requirements. In addition to the Taff Vawr sources of supply the Corporation had power to abstract 3,000,000 gallons of water per day from the River Ely, as well as to take water from an area of 2,000 acres at Lisvane and Llanishen, all of which was suitable for trade and sanitary purposes, and might be made use of by means of duplicate mains. Mr. Priestley has just prepared a scheme for utilising the water from the River Ely for trade and sanitary purposes. It was proposed to pump the water from the river into the Penhill service reservoir, from which it would gravitate through the new mains to be laid throughout the town.

ARCHITECTURAL ASSOCIATION OF IRELAND.—On the 3rd inst. at a general meeting of the Architectural Association of Ireland, held at the Grosvenor Hotel, Mr. T. G. Hicks presiding, a lecture on "Heraldry and Heraldic Ornaments" was delivered by Mr. Crawfurth Smith. The lecturer, in the course of his address, which was profusely illustrated, said heraldry was the art of explaining by way of various forms, symbols, objects, and colours, achievements of persons and families both individually and collectively according to their various ranks of life. These originally appertained to their arms, trappings, liveries, and robes of State and office, and by expansion were employed pictorially and in sculpture or stonework. parchment, &c. These signified, in days when reading and writing were unknown generally, the various ranks, stations, and histories of the people to whom they belonged. As to its origin, some forms of representation akin to heraldry were coeval with primitive man, but were not raised to a science until comparatively recent days. The lecturer then gave illustrations of various coats of arms, and said that the beginning of the twelfth century marked the most brilliant period of heraldic ornaments, and this continued until the decadence of the seventeenth century. With the last of the Tudors heraldry as a decorative art rapidly declined. With occasional exceptions they might dismiss the history of heraldic decoration until the building of the Houses of Parliament. The last century had witnessed the revival, the study, and execution of heraldic ornamentation.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—The first ordinary meeting of the Society of Engineers for the present year was held on Monday, the 2nd inst., at the United Service Institution, Whitehall. Mr. Percy Griffith, the President for 1902, first occupied the chair, and presented the premiums awarded for papers read during that year, viz. :—The President's Gold Medal to Mr. Thomas Andrews, F.R.S., for his paper on "The Effect of Segregation on the Strength of Steel Rails"; the Bessemer Premium of Books to Mr. Augustus R. Galbraith for his paper on "The Hennebique System of Ferro-Concrete Construction"; a Society's Premium of Books to Mr. Benjamin H. Thwaite for his paper on "British *versus* American Patent Law Practice and Engineering Invention," and a Society's Premium of Books to Mr. Brierley D. Healey for his paper on "Recent Blast Furnace Practice." Mr. Griffith then introduced the President for the present year, Mr. J. Patten Barber, to the meeting, and retired from the chair, receiving a hearty and unanimous vote of thanks for his services during the past year. The President, in his inaugural address, congratulated them on the membership being 523, the highest number the Society had ever had. In dealing with some of the works which concerned an engineer holding a municipal appointment, he stated that they were so numerous that it would only be possible to refer to a few which were of general interest. In regard to roads, in which the public interest had been revived since cycling became common, the use of more suitable stone, broken to proper sizes, steam rolling, and the more judicious application of binding material, had largely contributed to the improved state of the main roads. It was impossible to fix the stones on a macadam road by the method advocated by critics of making them "unite by their own angles;" even in McAdam's time the fixing of the stones was accomplished by the small particles ground off the loose stones by the traffic. The addition of suitable binding material was necessary even when a steam roller was used for consolidating the new coat of stone with which a macadam road was repaired. Tar macadam formed a cleaner and smoother surface than ordinary macadam, but was more slippery and not suitable for very heavy traffic; it made an ideal road for cyclists and motorists, but its great cost made the formation of a track along the roads improbable. The use of the scarifyer for breaking up the surface of macadam roads prior to repairing them enabled the work to be done more effectually, and at about one-third of the cost of hand picking. For paving town roads of very heavy traffic, granite setts, asphalt, and wood were used, but the former were frequently objected to on account of being noisy, and the second because of its slipperiness, wood being the material most favoured by the public. Jarrah wood, from Australia, was chiefly used for wood paving, although there were other hard woods equally suitable, but they were not obtainable in quantities. The supply of other woods was a subject deserving the attention of the Colonial Governments, but, at the same time, the planting of trees should be carried on in order to make the timber industry an enduring trade. For the cleansing of roads, the horse scraper and the machine broom were of great service, and a machine was needed which would sweep mud or dust from a road and transfer it to a vehicle for removal, so as to save the labour and time occupied in forming it into heaps and loading into vans by manual work. The prevention of dust from the roads in the busy streets of a populous town was absolutely essential, the fine particles of refuse and debris from the pavements being very offensive and injurious. Specially constructed vans, which would spread water, to which a disinfectant had been added, in a very fine spray on the road surface, might be tried; and perhaps a machine which would take up the dust from the road by exhaustion, and discharge it into a receptacle containing water might at some time be invented. Pavements which add little to the noise produced by traffic were necessary in the principal streets where business was carried on, and although the noiseless shoe for horses did not seem to be practicable, improvements should be made in the construction of vehicles so as to diminish the clatter made by them. Referring to the disposal of house refuse by means of destructors, the President remarked that great improvements had been made which had resulted in more perfect combustion both of the refuse and the gases from the cells, and that no nuisance was caused in the neighbourhood of properly-designed installations. From the clinker, paving bricks, and other articles were made by hand or hydraulic machinery. It was desirable that the dust which filled the air in the destructor building during the clinkering of the cells should be prevented. From the burning of house refuse steam was raised and used for pumping and other useful purposes. Speaking of sewerage, the President observed that increased knowledge of hydraulics and the manufacture of more suitable materials had enabled engineers to construct better sewers than those of fifty years ago. The carrying away of storm-water was a serious problem in rapidly extending towns, and sufficient provision had not been made for dealing with rainfall in earlier schemes of sewerage. The results of many experiments and the actual working of various systems for dealing with sewage had shown the efficacy of bacterial processes for purifying crude sewage.

THE JUNIOR INSTITUTION OF ENGINEERS.—A meeting of this Institution was held at the Westminster Palace Hotel on the 6th inst., when a paper on "The Calorimetry of Gaseous and Liquid Fuels" was read by Mr. W. Garnet Wernham. After emphasising the importance of means for conducting a rapid and simple test of the heating value of fuels, the methods employed were described in detail. The first, the analytical method, was stated to be more suitable to the laboratory, but where carefully carried out was extremely valuable for checking the result obtained by the direct calorimetric test. This latter method was next investigated, the calorimeters of Rumford, Fabre & Silbermann, and Berthelot being first illustrated, as they were distinct from instruments of the Hartley, or flowing-water type. Several of these latter instruments—the Hartley, Junker, and Simmance and Abady calorimeters—were explained in detail and a description of a test with the last-named instrument was given. The calorimetry of liquid fuels was next considered, and the methods of burning the oil were described, the analytical test being unreliable for this class of fuel. The question of the standardisation of calorimeters was entered into, the author suggesting that an efficiency test should be made with gas of a known heating value, such as hydrogen or pentane air-gas, and a constant given for each instrument. In conclusion, a plea was made for uniformity in methods of expressing calorific values, the English and French units being at present used together in a manner calculated to cause great confusion.

COMPETITIONS.

WORKMEN'S DWELLINGS, ECCLES.—The competition for the erection of dwellings for the working class at Eccles has just been decided:—The 1st premiated design is by Mr. George Meek, Leinster Chambers, 4, St. Anne's-square, Manchester; the 2nd is by Mr. George Wescott, 11, King-street, West Manchester; and the 3rd by Messrs Mee & Hooley, 32, Victoria-street, Manchester.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Sir J. McDougall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Hackney Borough Council 20,570*l*. for electric lighting and other purposes; Wandsworth Borough Council 2,000*l*. for street improvement; and Hammersmith Borough Council 5,000*l*. for street improvements. It was also agreed to sanction the loan of 770*l*. to Islington Borough Council for electric light installation.

Holborn to Strand Improvement: Naming the New Streets.—The General Purposes Committee recommended, and it was agreed with general commendation, that the crescent-shaped street now being laid out on the site of Wych-street be named "Aldwych," and that the new main street to be constructed from Holborn to the Strand be named "Kingsway."

Theatres, &c.—The Theatres and Music Halls Committee recommended, and it was agreed, to sanction (1) proposed seating arrangements in the stalls and pit and dress circle at the Criterion Theatre (Mr. F. T. Verity for Sir Charles Wyndham); (2) alterations to the lavatories and bars at the South London Music Hall, London-road, Southwark (Messrs. Wylson & Long).

The Horniman Museum and Gardens.—The Historical Records and Buildings Committee presented a report, in which they recommended that a house next to the Horniman Museum should be demolished.

Colonel Rotton protested against the proposed demolition, on the ground that the house was one of six which Mr. Horniman had presented to the Council for the purpose of helping to provide for the upkeep of the Museum. He moved to refer the recommendation back.

Lord Welby seconded the amendment.

Mr. Dolman said it was the intention of the donor of the museum that these houses should be demolished as soon as the leasehold interest in them fell in.

The amendment to refer the matter back was carried.

London Locomotion.—The Council voted 500*l*.

to enable their officers to report more fully upon the question of locomotion in London.

Increase of Artisan Students in Polytechnics.—The Technical Education Board reported as follows :—

"The results recently published of the examinations conducted by the City and Guilds of London Institute afford striking evidence of the rapid growth of technological classes in London institutions. The subjects in which examinations were held included plumbing, brickwork, masonry, plasterers' work, painters' and decorators' work, carpentry and joinery, engineering, gas manufacture, goldsmiths' work, watch and clock making, carriage building, bookbinding, wheelwrights' work, builders' quantities, telegraphy and telephony, metal plate work, &c. The number of workmen attending these classes for 1902 was 6,731, as against 5,193 for 1901, an increase of 30 per cent. in one year. The numbers attending the more important classes were as follows :—electric lighting, 1,059; plumbing, 540; carpentry and joinery, 522; mechanical engineering, 515; telegraphy and telephony, 501; builders' quantities, 407; brickwork and masonry, 271; metal plate work, 165; painters', decorators', and plasterers' work, 151; goldsmiths' work, 62. The above figures do not include the students working in technical institutes not presenting candidates for the examinations. The number of student-hours worked by the 6,731 students in the classes examined by the City and Guilds of London Institute was considerably over 400,000 during the session. In technological subjects fewer of the students enter for the examinations than for the science subjects of the Board of Education, as the certificates are not used to the same extent for special purposes; it is therefore very satisfactory to notice that 2,209, that is, about 33 per cent., presented themselves for examination, and of these, 1,314 obtained certificates, and forty-nine obtained prizes or medals.

The action of the Board in instituting evening exhibitions of 5*l.* a year for two years in science and technology has done much to stimulate artisan students to good work and enable them to remain at the polytechnics for advanced instruction for a much longer period than is usually the case. The following list gives the number of exhibitions won by a few typical classes of artisan students during the past five years :—Carpenters, joiners, and cabinet makers, 90; plumbers and plumbers' mates, 47; bricklayers and masons, 46; engineers' assistants, fitters, and pattern makers, 70; painters, decorators, and plasterers, 26; draughtsmen, 36.

About 20 per cent. of these exhibitions have been extended for a further period of one year on the result of the excellent work of the students and the strong recommendation of the teachers. The competition for the exhibitions increases year by year. In the adult section there were over 500 entries for the competition in June, 1902, and 140 exhibitions were awarded. The work sent in was far in advance of that of previous years. Many of the students who win these exhibitions are in attendance at polytechnic trade classes for periods varying from four to seven years."

Clapham and Hammersmith Schools of Art.—The following recommendations were agreed to :—

"(*a*) That under the provisions of the Schools for Science and Art Act, 1891, the Clapham School of Art and the Hammersmith School of Art be acquired by the Council, and that the work of these schools be conducted directly by the Technical Education Board on behalf of the Council.

(*b*) That out of moneys in the hands of the Board the building lease of the Clapham School of Art premises be purchased by the Council, subject to a ground-rent of 36*l.* 7*s.* 6*d.* per annum, for the sum of 2,250*l.*, from the Clapham School of Art Company."

Tramways—The following recommendations of the Highways Committee were agreed to :—

"That the expenditure on capital account be authorised of a sum not exceeding 1,350*l.* in connexion with the laying of tramway tracks and the provision of electrical equipment therefor and for certain other works at the temporary car-shed in course of erection at the Balham tramways depot.

That the expenditure be authorised of a sum not exceeding 1,200*l.* in connexion with the laying and the electrical equipment of the tramway tracks, the excavation of car-pits, &c., in the temporary car-shed to be erected at the tramways depot, Rye-lane.

(*a*) That the site belonging to the Council at Hughes-fields, Deptford, between Blake-street and Barnes-alley, be appropriated for the provision of re-housing accommodation for 214 persons to be displaced in connection with the erection of the Greenwich electricity generating station.'

Working-class Dwellings.—The Housing Committee recommended that an estimate of 9,983*l.* be passed for the erection of Darcy-buildings, London Fields, for the accommodation of persons of the working classes.

Mr. Beachcroft said the recommendation afforded food for reflection. They found that the land had to be written down to nil, and now, after proposing to spend 9,900*l.* on buildings, the estimated surplus was only 13*l.* a year.

Sir W. Collins, in reply, pointed out that the writing down of the value of the land had already been agreed to, on the recommendation of the Improvements Committee.

The recommendation was agreed to.

The Treatment of London's Sewage.—The Main Drainage Committee recommended the expenditure of a sum not exceeding 500*l.* for printing and binding 2,000 copies of a book prepared by Dr. Clowes and Dr. Houston, on the experimental bacterial treatment of London sewage at Barking and Crossness.

Mr. Campbell objected to the expenditure as being a wicked waste of public money.

Sir Henry Bliss remarked that it was very important that the Council should possess every possible information with respect to the treatment of sewage, and he might say that before long the Main Drainage Committee would submit important developments with regard to the disposal of the effluent, which, he believed, would attract a large amount of public attention.

Sir W. Collins observed that, when Sir Arthur Arnold was the Chairman of the Council, he said that their method of treating sewage was the best in Europe. Now, however, he understood there was to be a development in the treatment. Reports would appear to show that the effluent was far from a harmless one, even after a thorough treatment in the septic tank and passing through coke breeze—indeed, he gathered from some experiments with animals that fatal results had ensued from the effluent. He sincerely hoped the Main Drainage Committee would not feel that the last word had been said with regard to the bacteriological treatment of sewage, or would assume that it was necessarily in advance of any other method of treatment.

Mr. Burns, M.P., said that, as a member of the Main Drainage Committee for fourteen years, he would want a lot of argument before he voted in favour of the immediate abandonment of the present system of treating sewage at Crossness and Barking. The bacteriological treatment of sewage was not the modern question that some modern experts thought it was.

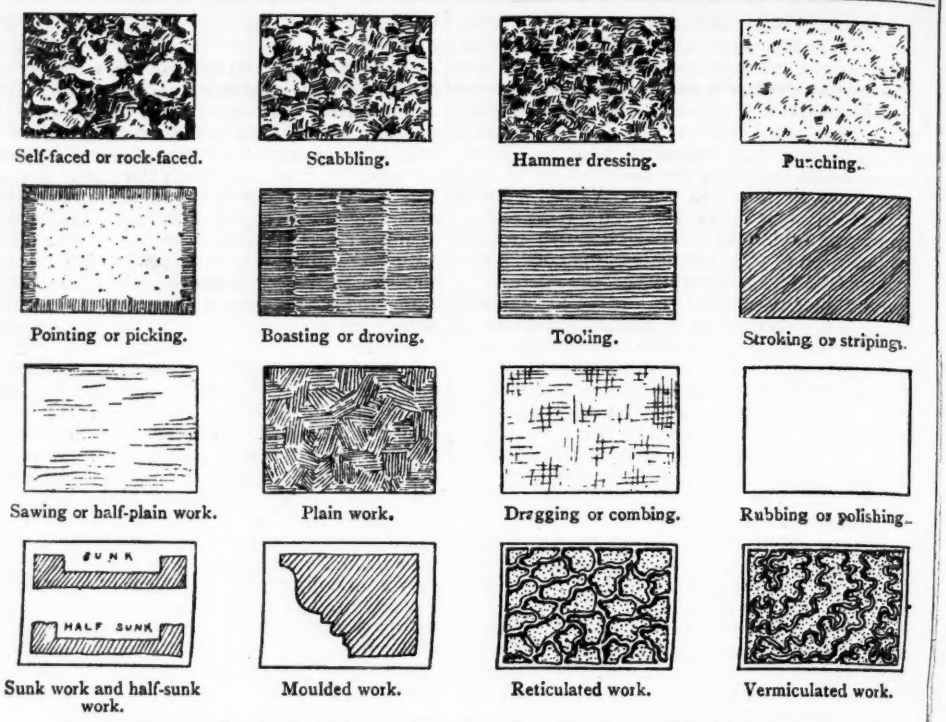
The recommendation was agreed to.

Advertisements on Tram-cars.—Considerable discussion took place over the proposal of the Highways Committee to allow advertisements on the top boards and the inside of the ventilators of the new electric cars.

Mr. Baker strongly urged that no advertisements should be allowed, and moved an amendment to refer the proposal back, and this was seconded by Dr. Longstaff.

Lord Welby pointed out that for the year 1903-4 there would be few receipts from the tramways, and now was hardly the time for dropping their advertisements.

The debate was adjourned, and the Council rose at 7 o'clock.



Illustrations to Student's Column: Sketches of various forms of finish to masonry.

The Student's Column.

BUILDERS' TOOLS AND THEIR USES.

CHAPTER 3 (*continued*).

Labours to Stonework.

THE successive stages through which freestone passes from the rough to the fine state are indicated in the above diagrams :—

The tools differ with the quality of the stone, but those generally used, in consecutive order, are :—

The *Scabbling Hammer*, or mason's pick and hammer, is employed for scabbling or scappling, that is, roughly reducing the stones after they have been got out of the quarry somewhat to an outline of the desired shape. It weighs from 15 lbs. to 22 lbs, the flat or spalling face being 4½ in. by 1½ in., for knocking off protuberances, and the pick end to reduce the irregularities of the surface. Scabbled work is said to be "quarry-pitched," which implies that the projections are "pitched" off at the quarry.

The cavil and jedding-axe, used for like purposes, are nearly identical in form and size to the scabbling hammer.

The *Spalling Hammer*, or quarryman's hammer, is double faced, and in demand for the same purpose as the three last-mentioned tools, but only for the roughest work. It weighs from 20 lbs. to 30 lbs. (fig. 69).

The *Waller's Hammer*, or face hammer, has one blunt and one cutting end, the head being 10 in. long by 3 in. wide. It is not so heavy as the scabbling hammer, and the axe-shaped end is required for hammer dressing, which is the next description of work after scabbling, being of the same nature but not so rough in execution. It is also employed for roughly squaring stones in rubble work (fig. 70).

The mash hammer has already been described under "Bricklayer." It is used upon the hammer-headed chisels.

The hammers having produced a rough approximation to a plane surface, pitching tools, punches, chisels, &c., are next called into use. In the neighbourhood of London and other localities the term "chisel" is applied only to cutting tools from a ¼ in. to 2 in. broad, those above 2 in. being classed as boasters or tools. These cutting instruments are of iron, with steel edges, and are arranged as follows :—

The *Pitching Tool* has a bevelled instead of a cutting edge, about 2½ in. wide, and is employed with the mash hammer for knocking or

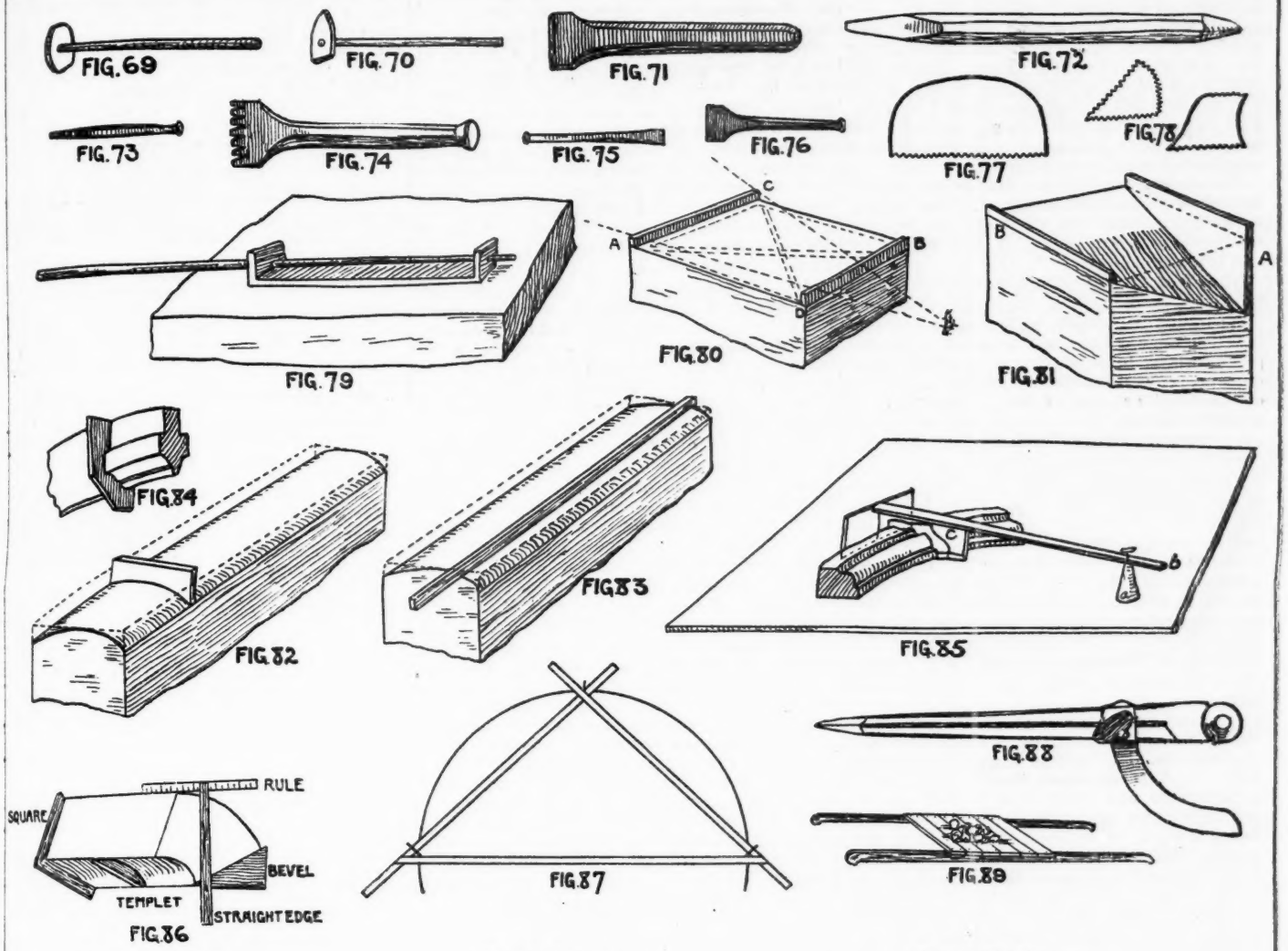


Fig. 69.—Spalling hammer.
Fig. 70.—Waller's hammer.
Fig. 71.—Pitching tool.
Fig. 72.—Punch.
Fig. 73.—Point.
Fig. 74.—Tooth chisel.
Fig. 75.—Inch tool.
Fig. 76.—Boaster.
Fig. 77.—Drag or comb.
Fig. 78.—Cockscombs.
Fig. 79.—Iron rubber.
Fig. 80.—Forming a plane surface.
Fig. 81.—Winding or twisting surface.
Figs. 82 and 83.—Working cylindrical surface.
Fig. 84.—Mould.
Fig. 85.—Trammel mould.
Fig. 86.—Working a voussoir.
Fig. 87.—Use of sweeps.
Fig. 88.—Wing compasses.
Fig. 89.—Hand barrow.

Illustrations to Student's Column.

"pitching" off the smaller projections along the edge of a stone (fig. 71). It does not, however, lend its name to any particular mode of stone dressing.

The *Punch* has a blunt edge ¼ in. long, and is required for punching the surface, which is thus coarser than pointed work. It is used with the hammer (fig. 72).

The *Point* is a preparatory tool, with a steel end about ¼ in. broad (fig. 73), its use leaving the stone in narrow furrows, with rough ridges between, which are cut away by the inch tool and made smooth by the boaster. The point is used with the mallet, and is employed for pointing or picking the face to a regular surface, which becomes pock-marked in appearance. It is capable of being worked to an unusual degree of fineness, which may be the final finish, and a "pointed" stone is usually chisel-drafted about 1 in. wide round the margins, which are then styled "drafted margins." These borders are here necessary to insure proper arrises for the accurate fitting of the joints of each block, which would otherwise present an undulating surface over its whole face; they are cut with a tooth-chisel, having nicks or teeth in its cutting edge, as shown in fig. 74. The tooth-chisel is only adapted to marbles and sandstones, though all the edges of cut stones (at least of quoins) are usually drafted.

The *Inch Tool* levels the ridges left by the punch and point, producing still greater smoothness. The size is 8½ in. by 1 in., and it is illustrated in fig. 75.

The *Boaster*, or bolster, is 8 in. long and from 2 in. to 3 in. wide, and is used for the operation of boasting, called droving in Scotland, which smoothes away the roughness left by the inch tool, and prepares the surface for a finer finished face (fig. 76). Boasted work is nearly always done with the tool at an angle, and varies with the texture of the stone as to the number of blows or lines to the inch, producing a corduroy appearance. It is really a levelling of the surface, and the boaster often takes $\frac{1}{16}$ in. or so from the top of the stone, thus in a manner dressing it. It is, in fact, "a more regular description of chiselling, in which the marks of the tool run in parallel lines, each successive stroke being made beneath the last, down the whole length of the stone. The same operation is repeated till the marks extend over its whole breadth. The lines are not continuous across the whole width of the stone, but resemble columns. Boasting may be described as roughly preparing for a finer finished face. Limestones and grits are the stones which are usually boasted.

The *Broad Tool*, or tooler, is similar to the boaster, but about 4 in. wide at the cutting edge, and is employed for the process of tooling, which is similar to boasting, except that the strokes form a continuous series of parallel lines, each line extending across the whole of the stone, as indicated in illustration. It is, in fact, superior boasting. Tooling is generally executed after the work is boasted, and is simply of an ornamental character, the operation requiring to be finely done, and the idea being to make each stone in a building look as if finished by one machine. Each line or hollow is completed before commencing the following one, and these are always at right angles to the bed of the stone. The process of tooling is now uncommon in this country.

Stroking, or striped work, differs only from tooling in the direction of the lines, which run diagonally at an angle of about 45 deg., instead of parallel to the edges of the stone.

Sawing, or half-plain work, is the surface produced after sawing.

Plain work is the resulting surface after the inequalities left by the saw, punch, or point have been dressed down by chisels and tools, as the former leave their traces in irregular marks over the stone, and the broader the chisel the smoother the surface.

Half-plain work and plain work are the labours usually left upon the bed and side joints of cut stones in walling.

The *Drag*, or comb, is needed for dragging or combing very soft stones, such as Bath stone, to an extremely even surface, for the sake of appearance and to prevent the destroying action of the weather which would otherwise take place on a rough texture. It is a thin plate of steel with teeth like a saw, or it may be a piece of an old saw itself, with teeth according to the degree of fineness required (fig. 77).

Cockscombs are specially shaped drags for moulded work in soft stones (fig. 78). Drags are of three grades—coarse, medium, and fine.

An *Iron Rubber* is the requisite implement for hand rubbing or polishing, which is plain work rubbed down with sand and water to a perfectly smooth surface, the face of the stone having been previously dressed as evenly as possible. A stick is inserted through the two holes of the iron for grasping and manipulating the rubber to and from (fig. 79). Rubbed stones have no margins. Rubbing is also done by rubbing one stone with another, and using water and sand.

When the word "finished" is used, it means that the work has been gone over to put a particular and final surface upon it after it has been really completed.

Sunk work is the labour of making any surface below that originally formed, such as in panels, sloping surfaces of sills, &c. If the original surface was smooth it is properly called sunk work; if rough, half-sunk.

Moulded work is as its name implies, and is strictly speaking, the term given to profiles with a change of curvature, and should not be applied to cylindrical sections, such as columns, which is circular work. For fuller description see *Templets* and *Moulds*. The edges of the tools used for working mouldings

are necessarily narrower than those employed for ordinary face work.

Reticulated work means resembling network, and vermiculated work means resembling the motion of a worm. These labours are chiefly placed on quoin stones to give effect, and are enclosed by margins about ¾ in. wide. The irregularly-shaped sinkings between are punched with a pointed tool to give them a rough pock-marked appearance.

The *Square* used by the mason has already been described under Bricklayer. The method of its application will be better understood further on. A set square is also employed, and is made of iron.

The *Straight-edges* of the mason are similar to those employed in the bricklayers' and other trades, but usually with the addition of a bevelled edge. They are required to enable plane surfaces to be formed on a rough block of stone, or, as it is termed, to take a face "out of winding," *i.e.*, out of its irregularities, an unequal surface, not in one perfect plane, being said to "wind." Hence they are frequently referred to as *winding sticks*.

The following description of "How to Form a Plane Surface" has been extracted from Dobson's "Masonry and Stonecutting" as the method of operation will be interesting to the student: "First, when the surface is of considerable size (fig. 80). Two diagonal chisel drafts, as AB, CD, are run across the surface and connected by cross drafts, as AD, CB, and DB, AC. The superfluous stone is then knocked off between the drafts, until the surface coincides in every part with a straight edge.

"Second, when the surface is small. In this case a chisel draft is sunk along one edge of the stone, and a rule or straight-edge placed upon it. The workman then takes a second similar rule and sinks it in a draft on the opposite edge, until the upper edges of the rules are out of winding, that is, in a level surface (tested by sighting them across), when the two drafts will be in the same plane, and the face may be dressed between the drafts." A stone is taken out of winding principally with points, and finished with the inch tool.

Winding Strips and *Twisting Rules* also come under the category of straight edges. They are indispensable for forming a "winding" or "twisting" surface on stone. Fig. 81 illustrates what is meant, A being the winding-strip and B the twisting-rule, the wind, twist, warp, or slope falling from corner B to corner A. Drafts are cut in the ends of the stone until the tops of the winding-strip and twisting-rule are in a plane. The remainder of the projecting face is then removed until a straight edge, when applied parallel to the edge of the stone, will just touch the end drafts and the intermediate surface. A surface may be twisted at one or both ends.

Templets and *Moulds* act as guides in reducing the stone to the required profile, and they are made of thin wood or sheet zinc. A templet, for instance, is necessary when working cylindrical surfaces, which are produced in either of two ways. First, by cutting a draft along the line of intersection of the plane and cylindrical surface, and applying a curved templet to the required surface (fig. 82), or, second, by cutting a circular draft on the two ends and applying a straight-edge along the rectilinear parts (fig. 83). A mould, having one of its sides cut to the intended profile, is shown in use in fig. 84, while fig. 85 illustrates the working of a portion of an arch by means of a trammel mould, *a* being the centre of the circle of which the required moulding is an arc. This centre *a* is built up, cone-shaped, with a dovetailed wooden block taking a gimlet or nail penetrating the radius rod *b*, at the opposite end of which is fixed the running mould *c*, showing a section of the Norman edge-roll or bowtell.

Fig. 86 gives an idea of the various uses of squares, rules, bevels, templets, and straight-edges in working the voussoir of a hemispherical dome.

Sweeps.—The employment of sweeps is so clearly stated by Dobson, in his book beforementioned, that one cannot do better than give his description here, which is as follows:—"When the radius of a curve exceeds 5 ft. it generally becomes necessary to describe it without making use of the centre, and for this purpose *sweeps*, or curved rulers, are used, by means of which the curves are drawn in between points previously ascertained by calculation. These sweeps are made of thin wood, on which the curve is first struck with the trammel as follows:—Find by calculation, or otherwise, three points in the curve, the middle point being in the centre between the extreme ones, or nearly so. Fix a pointer at each of the extreme points, and lay against them two straight-edges, so that their intersection shall coincide with the central point. Secure the straight-edges in this position with a cross piece, as shown in fig. 87, and the curve may then be drawn with a fine-pointed pencil placed at the intersection of the rules, the trammel being pressed steadily against the pointers whilst the curve is drawn. Take off the superfluous wood with a plane, and the sweep is ready for use.

An instrument called a cyclograph, constructed on this principle, is sometimes used for drawing arcs of circles, but it is expensive; and the use of sweeps is preferable, if the length of the curve is such that the work cannot be done without shifting the instrument, as it is very difficult to make a neat junction between the different portions of the curve."

Before dressing his stone the mason lays out on a large wooden floor, or platform, *full-size* plans, sections, and details of his work, carefully marking all joints and dimensions, exactly as they will appear when put up in the building. These full-size figurations are obtained from the architect's working drawings, and from them the templets, moulds, bevels, &c., are made. The full-size drawing or tracing is placed over a sheet of thin zinc (No. 9 is a useful gauge), and the profile pricked through with a fine-pointed steel scriber. The zinc templet is then cut into shape with a pair of tinman's shears, or cut with a hammer and chisel on an iron plate, as near to the line as possible, and afterwards carefully filed to the required form to give it a true edge.

It is customary to mark and number each cut stone from the time it leaves the quarry or mason's yard to its final resting-place on the building, and each block should be numbered as nearly as possible in the order in which it will be set to avoid confusion and waste of time on the job. Cut stone mouldings, carvings, bases, &c., should be protected during the erection of the edifice by thin pieces of wood temporarily nailed to the joints of the masonry and removed as the scaffolding is taken down.

All tracery work is sawn from the rough block in the position known as face-bedded. It would be impossible to produce tracery on blocks sawn on their natural bed, the stone being in that case highly liable to flake off. Sills and jambs, on the other hand, are, of course, sawn on their natural or quarry bed.

Rule.—A mason's rule is as often a 2-ft. two-fold steel one, as one made of boxwood.

Spirit Level.—This is like the bricklayer's, and should be at least 18 in. long.

Compasses, common or ordinary, and wing, are identified with the setting out of work, describing curves, taking minute measurements, &c. The former are of steel, about 7 in. long, while the latter, 6 in. to 24 in. in length, are provided with an arc or wing along which the legs may be graduated by means of a thumb or pinch screw. Fig. 88 indicates a pair of wing compasses.

The *Hand Barrow*, in contradistinction to wheelbarrow, is indispensable for carrying (not wheeling) heavy stones to and fro. Its use will be understood by a reference to fig. 89.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Paddington, South.—Three buildings, with one-story shops in front, upon the site of Nos. 60 and 62, Westbourne-grove, Paddington (Mr. A. Young for Mr. J. Rossdale).—Consent.

Line of Frontage and Construction.

Wandsworth.†—An iron and glass verandah in front of No. 25, Mitcham-lane, Streatham (Messrs. J. H. Jenkin & Co. for Mr. R. Shakeshaft).—Refused.

Width of Way.

Hackney, South.—Buildings on the west side of Homerton-terrace, Hackney, to abut also upon Park-place and Morning-lane (Messrs. Hodson & Whitehead for Messrs. Smith & Howe).—Consent.

St. Pancras, East.—A two-story workshop at the rear of No. 282, Camden-road, St. Pancras, with the external walls of such workshop at less than the prescribed distance from the centre of the roadway of Camden-mews (Mr. T. B. Westacott for Messrs. J. & H. Bangs).—Consent.

Woolwich.—Two houses on the north-west side of Red Lion-lane, Shooter's Hill, Woolwich (Mr. A. E. Parnell for Mr. J. Sandford).—No order.

Space at Rear.

St. George, Hanover-square.—To raise a portion of a building on the north and east sides of Dover-yard, Piccadilly (Colonel R. W. Edis for Lord Wolverton).—No order.

Width of Way and Space at Rear.

Greenwich.†—Working-class dwellings on a site on the west side of Hughes-fields, Deptford, and south side of Benbow-street (Mr. R. Robertson for the Housing Committee of the Council).—Consent.

Adaptation of Street for Carriage Traffic.

Strand.—Adaptation for carriage traffic of a portion of Martlett's-court, Drury-lane, Strand (Mr. H. O. Ellis for Mr. L. U. Gill).—Refused.

Dwelling-houses on Low-lying Land.

Lambeth, North.—Two buildings on low-lying land situated at Nos. 9 and 10, New-cut, Lambeth (Messrs. Flood & King for Messrs. Grogan & Ruscoe).—Consent.

*** *The recommendations marked † are contrary to the views of the Local Authorities.*

BOOKS RECEIVED.

SHAKESPEARE'S CHURCH, STRATFORD-ON-AVON. By J. Harvey Bloom, M.A. (T. Fisher Unwin. 7s. 6d.)

THE YEAR'S ART: 1903. Compiled by A. C. R. Carter. (Hutchinson & Co.)

MODEL GENERAL CONDITIONS FOR USE IN CONNECTION WITH ELECTRICITY WORKS. Issued by the Institution of Electrical Engineers. (E. & F. N. Spon.)

THE RATING OF ELECTRIC LIGHTING UNDERTAKINGS. By W. G. Bond. (*Electrician* Publishing Co.)

GENERAL BUILDING NEWS.

SCHOOLS, LYNN MEMORAL CHURCH, BELFAST.—The new national schools erected in Baden-Powell-street, Oldpark-road, in connexion with this church were opened on the 30th ult. The buildings have a frontage on Baden-Powell-street, and there are, at the rear, playgrounds extending to Buller-street. The ground floor is occupied by an infants' schoolroom; a classroom, with infants' gallery, opens off the large room on the ground floor, and an entrance-hall gives access to the girls' and infants' cloakrooms and to the detached sanitary wing. The principal schoolroom, on the first floor, is reached by a staircase from the entrance-hall. A boys' cloakroom opens off the landing. A teachers' room for advanced classes is also approached from the landing, and is connected with the upper schoolroom. The façade to Baden-Powell-street harmonises with the style of the church. The schools are heated throughout by Messrs. Musgraves' system, the furnace for which is in the heating chamber in the basement. The ventilation has been arranged on the natural system, with Sherrigham inlets and extract ventilators, on the first floor upcast shafts being connected to the ventilator on the ridge. Mr. James Trotter was responsible for the building operations, which have been carried out from the plans and under the superintendence of Mr. James S. J. Phillips, architect, Belfast.

SCHOOLS, DOVER.—The foundation stone of the new school which is being built by the Dover Church Schools Company, at Elms Vale, was laid recently. This school, which has accommodation for 670 scholars, is for girls, boys, and infants. The architects are Messrs. Worsfold & Hayward.

RESTORATION OF BLABY CHURCH, NEAR LEICESTER.—The parish church of Blaby was reopened, recently, after complete restoration. The building dates from the early part of the thirteenth century, and the present work was rendered necessary by the spreading of dry rot in the floor and seats. Under the direction of Mr. H. L. Goddard, architect, of Leicester, the seats have been removed and their arrangement altered; a wood-block floor resting upon concrete has been introduced, and new pews and choir stalls, all of oak, have been put in. One feature of the restoration is that a carved oak pulpit has been presented to the church by two workingmen of the parish; one of them gave the wood, and the other made it in his spare time. In the course of the restoration three sedilia and a piscina were discovered in the south wall of the chancel; they had been bricked up and plastered over, leaving no sign of their existence.

TOWN HALL, EAST HAM.—On the 5th inst new Town Hall and Municipal Buildings for East Ham were opened. The building has been constructed of red brick, with terra-cotta dressings of

biscuit colour and Westmoreland green slate roofs, the whole dominated by a clock tower, 22 ft. square, rising to a height of about 150 ft., with open belfry stage, and breaking up into pinnacles. The general arrangement of the buildings is in the form of the letter L, the official department, including clerk's, engineer, and surveyor's, and accountant's offices, being in the vertical or left arm of the letter, parallel with Barking-road, with the large assembly hall over, the several committee-rooms, mayor's parlour, &c., being in the horizontal or foot portion, and the council-chamber, with police-court under, in the shorter vertical arm on the right The assembly hall has its own distinct approach, entirely independent of the entrances to the offices, though the latter are so arranged that they can be used in conjunction if occasion requires, and as extra means of exit for rapid dispersal in the event of a panic. This approach is through a doorway and a wide stone staircase and vestibule to an entrance hall, having ladies' and gentlemen's cloak and retiring rooms to right and left of it, and a corridor leading to the Council Chamber and Mayor's room, with a grand staircase on the right, and a separate staircase on the left to the gallery immediately over the hall, the gallery providing accommodation for 150 seats. In the centre of the hall, facing those entering, is the ticket office, with large doors right and left giving admission to the assembly-room, 100 ft. long and 50 ft. wide, providing seating for 1,200 people independent of the platform and organ recess at the end. Retiring-rooms are provided for the performers, with entrances and staircase approaches, and a chamber under the platform for storing chairs, tables, &c. Special exit doors in addition to the foregoing are provided for rapid clearance of the hall, and a service-room with a lift to the kitchen on the top floor is provided. The assembly-room is lighted by large windows on both sides. The Mayor's hall, with anteroom and waiting-room, are all *en suite*, with two large committee-rooms, and the latter are capable of being thrown into one by a disappearing screen when required. The council chamber opens out of a corridor on the right. A public gallery for 100 burgesses will be at one end, with separate staircase approach. All the halls, corridors, &c., of this floor are paved with polished marble mosaic of special design, and the whole is of fireproof construction. There is a residence for the caretaker, together with kitchens, &c. This is the first block of a scheme of municipal buildings, comprising technical school, public baths, coroner's court, &c. The general contractor is Mr. D. W. Barker, of Croydon. The heating has been carried out by Mr. Jeffreys, of Westminster; the electric lighting, telephones, &c., by Messrs. Fryer & Co., of Sloane-square. Messrs. Doulton & Co. supplied the terra-cotta, and Messrs. Congdon & Powell the railing round the buildings. The architects are Messrs. Cheers & Smith, of Twickenham and Blackburn, whose design was selected in open competition.

SCHOOL, LYNN, NORFOLK.—A new high school for girls has been erected at Lynn in Ferry-lane. The buildings have been constructed of red brick, with roofs covered with French tiles. The architect was Mr. H. J. Green, of Norwich, and his Lynn representative was Mr. C. J. Carnell. Mr. J. Cracknell, of Peterborough, was the builder.

HOSPITAL, LODGE MOOR, SHEFFIELD.—New hospital buildings have been erected at Lodge Moor, at a cost of 83,814*l*. The enlarged hospital gives Sheffield increased accommodation for patients suffering from infectious diseases. The city's facilities in this direction have been increased by upwards of 200 beds, and the number of patients for whom accommodation can be found at Lodge Moor, now that the extensions are carried out, closely approaches 400. The hospital occupies a site on the Redmires-road, about 4¼ miles from the centre of the city. The site is 42 acres in extent, and the buildings and recreation grounds occupy about 23¼ acres, the remainder being utilised as agricultural land. The administrative block, which forms the front of the building, faces due west. A water-tower has been erected 84 ft. high, and at the top is a tank containing 12,000 gallons of water. The water supply to the hospital is taken from the Corporation mains, and this tank is kept as a reserve. The lower stories of the tower are used as living and bedrooms for the porters. The administrative block is of four stories, of stone, lined with brick. In the centre are the entrance hall and office of the medical superintendent, with sitting and bedrooms for that officer and his assistants, and similar accommodation for the matron. To the right is the nurses' home. On the ground floor are sitting-rooms and a reading and writing-room. The three upper stories are composed of bedrooms, with three bathrooms on each floor. Box-room, linen-room, and other conveniences are also provided. There is accommodation for sixty-six nurses, each having a separate bedroom. The night nurses' quarters are quite apart from those given up to the day nurses. The maids' home, on the other side of the central buildings, is very similar. Here again are sitting-rooms and three ranges of sleeping-rooms. These are of the cubicle order; sixty beds are provided. There are again three bathrooms on each of the three sleeping floors. In this part of the premises are the sitting-room and bedroom for the assistant matron. The corridor, running parallel to the administrative buildings, is over 800 ft. long. To reach it from the main entrance one passes down the shorter administrative corridor, where are the dining-rooms for staff, nurses, maids, the stores, the kitchens, goods entrance, dairy entrance, matron's office and telephone exchange. From the long corridor the wards are reached. These are eighteen in number, and are arranged in sets of six, the north, central, and south. The two first-named are the old wooden wards, which were erected in great haste during the small-pox epidemic of 1887. Some of these have hitherto had to be used for administrative purposes, but now all will be put to their proper employment as wards. Each was designed to hold ten patients, but more are accommodated in them. In the north range of wards is the sitting-room of the night superintendent nurse. The receiving-room is at the entrance to the main corridor, and a bathroom is attached to it. The new wards are on the south side of the hospital. Each of the six is 120 ft. long by 26 ft. wide. There are in each ward twenty beds, and three or four children's cots. Each ward is equipped with two complete sanitary blocks, one at either end, and these are shut off from the wards by short passages, and double doors, between which are windows. There are separate bathrooms for adults and children, and each ward has its large airing court, which is shut off from all other parts of the hospital, A covered play-shed for the use of the children in wet weather has also been erected. Attached to each of these six new wards are two separation wards, one containing two beds and the other one bed, and there is a kitchen to every ward. The provision for isolating cases consists of eight wards, to be used for two to four beds each, and in every case there are kitchen, sanitary, and recreation facilities. The heating of the hospital is by low-pressure hot water, supplied by a calorifier to each pavilion. The hot-water supply is also by a calorifier to each pavilion, heated by steam. The boiler-house to supply all this heat contains two steam boilers, each 30 ft. long by 7 ft. in diameter. The hot-water pipes are laid in passages running underneath every part of the buildings. A porter's lodge and a waiting-shed for visitors to patients are among the new buildings. The dispensary and laboratory are conveniently situated. There are a mortuary, a laundry, a store for patients' hospital clothing, a sewing-room, stabling for five horses, and an ambulance shed, with coachman's house. The architects for the extensions are Messrs. Gibbs & Flockton, and the general contractors, Messrs. T. Roper & Son. The other contractors have been:—Plumbers' work, Messrs. Mellowes & Co.; slating and plastering, Messrs. C. Chadwick & Son; painting, Mr. A. Machin; ironfounders' work, Messrs. G. Oxley & Son; heating apparatus, Messrs. Dargue, Griffiths, & Co. (Liverpool); mosaic floors, Messrs. Hodkin & Jones, Ltd. Mr. J. G. D. Armstrong has acted as clerk of works.

TRAMWAY CAR SHEDS, ABERDEEN.—New car sheds have been erected at Queen's Cross from plans prepared by Mr. W. Dyack, Burgh Surveyor. The contractors were:—For mason work, Mr. Alex. Cheyne; joiner, Mr. John Kirkton; slater, Mr. Geo. Farquhar; plumbers, Messrs. Blaikie & Sons; painters, Messrs. Donald & Sons; plaster and cement, Messrs. Stephen & Sons. The cost of the buildings will be about 2,000*l*.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. R. Stevenson having resigned his position as the representative of the London Brick Co., has entered into partnership with Mr. Walter Browne, under the firm of Browne & Stevenson, 27, Leadenhall-street, E.C, as joint agents for the New Peterborough Brick Co., Ltd.

HIGH SCHOOL FOR GIRLS, WIESBADEN.—In connexion with the illustration and description of this building in our issue of January 10 (page 38), we find that we were misled in giving the name of Herr Conradi as the architect; he was the contractor. The architect is Herr Genzmer, the City Architect and a distinguished man, who has carried out other important buildings for the municipality of Wiesbaden. We can hardly be blamed for the mistake, as the description and illustration were furnished by an English traveller who particularly inquired from an official at the school the name of the architect, and was given the name of the contractor instead—evidently from a misapprehension of the question.

PETERHEAD MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Peterhead Master Builders' Association was held on the 30th ult. in the Royal Hotel. Mr. J. B. Dickie, the President of the Association, was Chairman over a company of about forty gentlemen, while Mr. William Hadden, builder, was croupier. After the loyal toast, the Chairman reminded the members that this was their sixth anniversary dinner. "Mutual co-operation" had been fully maintained. He regretted in the meantime that there was such a lull in the building trade, but he hoped that it would be of short duration. There had been nothing of an outstanding nature to deal with in the Association during the past year. They had severed their connexion with the Federation, but as the majority considered it right, comment on his part was needless. The year's deliberations had been carried on very harmoniously, and he trusted that in the future the same good feeling between the members would prevail.

THE HOUSING QUESTION, LIVERPOOL.—Councillor J. B. Colton, Deputy Chairman of the Liverpool Corporation Housing Committee, has been giving some particulars of the method about to be adopted in Liverpool for building cheap houses to accommodate the dispossessed slum population. The details, he states, are not yet perfected, but "the scheme was a reality, the plans were simply magnificent, and they would create a revolution in house building." Briefly, he said, the plan took the form of a concrete building made from refuse-destructor clinker. The engineer in Liverpool had perfected a method by which, instead of making small bits of brick, he could make the whole side of the house in one piece. The fronts, sides, floors, and roofs were all to be made in single individual parts, hoisted into position, and then bolted together. The mouldings, the skirtings, fireplaces, &c., were also formed in the mould and stamped out under one pressure, and would be hoisted into position just as were the outer walls. The houses would be of the tenement type, three stories high, and contain living room, two bedrooms, and scullery, each having its own watercloset. The cost of construction would be just about one-half of those they were building now in brick, and they could be erected at the rate of one house per day. He anticipated, if the experiment proved satisfactory, that the goal for which they had been striving— namely, rents at one shilling per room per week, would be achieved, and that they would be able not only to pay interest and sinking fund, but make a handsome profit. The cheapness of the material used, together with the short space of time it would take to construct, would effect an enormous saving in the amount of labour. Mr. Colton further stated that within six months these houses will be up, and ready for the inspection of other municipalities, who would then be able to see practical proof of what now appeared a "fairy tale."

THE EAST-END DWELLINGS CO.—The twentieth annual Report of this Company, submitted to the meeting held on the 9th inst., states that the Company has entered into possession of the site in Bethnal Green, with frontages to Globe-road, Cyprus-street, and Gauber-street. As stated in the last Report, the directors propose to keep the existing houses on this site standing for a time. They are well occupied, and seem for the present more popular than the new buildings of the Company in the same neighbourhood. Four blocks of dwellings, also in Bethnal Green, on the site of the old Militia barracks, which have been named "Merceron Houses" and "Montfort House," were finished during the summer, but the letting of these, and of "Gretton Houses," which were completed in 1901, has been disappointing, as 115 out of 256 tenements were unlet at the close of the year. Mendip and Shepton Houses, in the same neighbourhood, have also failed to let well, and twenty-four out of 126 tenements were empty at the end of the year. The Reports proceeds—"In view of the alleged scarcity of accommodation for the working classes this result is at once surprising and disappointing, as the houses are of a type which experience has shown to be popular, and are situated in a district almost exclusively inhabited by artisans and labourers. On the other hand, "Thornhill Houses" in Barnsbury, which were opened early in the summer, rapidly filled up, and only 4 of the eighty-three tenements were unoccupied when the year closed. On all the other properties the letting was, as usual, most satisfactory, and on December 31 every tenement and shop was let, except two rooms at Katharine-buildings."

MARLBOROUGH HOTEL, ST. JAMES'S.—This block of buildings having been acquired for the purpose of public offices, all the effects, furniture, and appointments of the hotel, by Messrs. Maple & Co., Benham & Co., Elkington & Co., and other well-known firms, have just been dispersed by sale by auction. The hotel was erected by Messrs. John Bennett & Co., contractors, of stone and red brick in 1897-8, after plans and designs by Mr. G. D. Martin. The site had been that of "Ramsay's" Hotel and No. 12, in Bury-street, and Nos. 12 and 14, in Ryder-street, St. James's.

THE ST. BARTHOLOMEW'S HOSPITAL COMMITTEE OF INQUIRY.—Sir William Emerson, past-President Royal Institute of British Architects, is one of the nine members nominated by the Lord Mayor to serve upon the Mansion House Committee of Inquiry in relation to the proposed extension, on the Christ Hospital site, of the hospital buildings and to other matters connected therewith. Six other members of the Committee, nominated by Sir Trevor Lawrence, the treasurer, are Governors of St. Bartholomew's. The Committee will consider and report whether it is desirable in the public interest and upon financial grounds to retain the hospital on its present site, and whether, if it is so retained, any better scheme of rebuilding than that now suggested by the Governors can be devised.

PROPOSED NEW DESTRUCTOR AT PRESTON.—On the 5th inst., Mr. H. Percy Boulnois, C.E. conducted a Local Government Board in

quiry, in the Preston Town Hall, into the application of the Corporation for permission to borrow 25,650*l.* for the erection of a new refuse destructor, &c., off St. Paul's-road. The Town Clerk (Mr. Hamer) stated that in 1885 the Corporation obtained a loan of 12,000*l.* for a destructor, store-yard, stables, &c., to be erected off St. Paul's road, and the total amount borrowed was 10,139*l.*, of which amount 4,261*l.* had been repaid. That destructor was now practically worn out, and the other premises were too small for present needs. The Corporation, therefore, sought to replace that destructor with a larger and more up to date building. The estimated collection of refuse yearly was 44,457 tons, and of this amount 717 tons were sold to farmers; about 10,000 tons were placed in tips; the present destructor off St. Paul's-road took 13,607 tons, and the destructor on the Marsh 20,000 tons. The new destructor would deal with 160 tons per day, the present collection being about 120 tons per day.

MUNICIPAL BUILDINGS SCHEME, ALDERSHOT.—Major J. Stewart, Local Government Board Inspector, recently held an inquiry into the application of the Aldershot Urban District Council for sanction to borrow 9,000*l.* for the erection of public offices and a fire-station upon a site in Grosvenor-road, on the Parish Clerk's Land. The designs by Mr. C. E. Hutchinson have been accepted for the new buildings.

SCREEN, MIDDLETON TYAS CHURCH, YORKSHIRE.—A screen is to be erected by Sir J. E. Backhouse at Middleton Tyas Church, in memory of the late Lady Backhouse. It has been designed by Messrs. J. P. Pritchett & Son, architects, and entrusted to T. M. Hobson, Darlington, to carry out. It is Gothic in design and is to be worked out of Austrian oak.

PUBLIC IMPROVEMENTS, LANCASTER.—At Lancaster, on the 3rd inst., Mr. Boulnois, of the Local Government Board, held an inquiry into the application of the Corporation to borrow 25,000*l.* for electric lighting purposes, an additional 10,000*l.* being authorised under the local Tramways Act. The total cost of the works, which were inaugurated in 1894, has been about 70,000*l.*, and the current will be generated for lighting and tramway purposes, being sold to the Tramways Committee at 2d. per unit.

PUBLIC IMPROVEMENTS, ECCLES.—At the meeting of the Eccles Town Council on the 4th inst., it was reported that the Local Government Board had sanctioned the Council's borrowing 21,975*l.* for the purchase of land for housing purposes. In the competition of plans for laying out the insanitary area of Eccles, the chief awards have been made to Mr. George Meek, Mr. George Westcott, and Messrs. Mee & Hooley, architects, all of Manchester. Permission to borrow 22,115*l.* for extending the electrical undertaking has also been given.

BARNSLEY FEDERATION OF BUILDING TRADES EMPLOYERS.—On the 30th ult. members of the Barnsley Federation of Building Trades Employers dined at the Royal Hotel, the occasion being the seventh annual dinner of the Federation. The proceedings were presided over by Mr. D. R. Snowden, President. Following the toast of "The King," Mr. J. Smith submitted that of the "National and County Federations." He had always felt that the best thing they ever did after forming themselves into a Federation was to join the Yorkshire and National Federations. During his experience as their delegate he had become more and more impressed by the fact of the necessity of their being federated into one large body. Isolation might be all very well for some, but not for those engaged in the building trade. Being united into one body enabled them to conduct their business as it ought to be conducted. Whilst they had no desire to take advantage of those who worked for them, they (the employers) still thought they had rights they ought to maintain. He knew well that the National and Yorkshire Federations had the best intentions, and did not wish to take undue advantage of the architects or the men they worked for, but desired what was right as between all parties. Mr. Smith referred to the good sound advice they had been able to get by being affiliated with the greater Federations, and spoke of the ungrudging way in which many gentlemen gave their time and money to help on the good work of the Federation. It was to be regretted, though, that there were some people who still held aloof from them, because it was pretty obvious that if these would join them they would not only strengthen the Federation, but would by so doing derive material benefit themselves.—Mr. Foradike, in responding to the toast, congratulated Mr. Snowden on his election for the second time to the Presidency of the Barnsley Federation. Councillor Judge also replied, in the absence of Councillor Good, of Hull. He urged that contractors should adopt the principle of giving sub-contracts to none but members of their own Federation.—Mr. J. Biggin proposed "Success to the Barnsley Federation of Building Trades Employers." One matter now being discussed, he said, was that of the wages of the employees. Many thought it was time the wages were lowered. The majority of employers would rather the wages remained as they were at present, but as trade got slower prices got lower. If they could only adopt the style of years ago, and do better work, and more of it, the wages could no doubt be kept up, but under present circumstances a lowering of wages all round appeared to be necessary. There was, however, no good done by first raising and then lowering the wages.—Mr. W. Dunk, who was the first of three to reply, said, in alluding to the advantages of the Federation, that before they were so united one could not distinguish what another man was in the building trade, unless he met him absolutely occupied in his own business. Being bound together enabled them to rub off rough places, so to speak, and to get rid of a lot of animosity which previously existed between employers and employed. They always knew they had the men's Union to meet when any grievance arose, and in times past their chance of upholding the dignity of the building trade was very remote, because they had no opportunity to assert their position. But now that they were a Federation, backed up by the Yorkshire and National Federations, the men knew that they had a power to meet, and did not resort to imaginary grievances, as they used to do. He was only sorry that their being federated had not helped to increase the prices as much as it had helped to elevate the standing of the building trade. Mr. Porter, in responding, said he had noticed that in various parts of the country not only the wages had been altered, but also the working hours. In some places they were working half an hour less per day than in Barnsley, yet the Barnsley people seemed quite satisfied with their arrangements. The Chairman also replied to the toast. He would never favour the lowering of wages. The best encouragement they could give their employees was to try to show them that the masters' interests were their interests. Mr. H. Ashworth gave the toast of "The Mayor and Corporation," and Councillor England replied. Mr. T. Lindley proposed "The Health of the Architects and Surveyors," and said those gentlemen met them as fairly as they could expect them to. Referring to the contract agreement, he said all of them knew that they had to sign some very peculiar documents, before doing which they had not always the opportunity of reading them. In the very near future the architects and surveyors would be asked to adopt a good uniform document, so that when the contractor went to the office he would know what he had to sign. Mr. Dixon, in responding, said it seemed to him that the interests of the architects and the contractors were identical, especially provided that the latter gave them good work, along with something like despatch. With that, he did not see why the architects should begrudge the contractors a reasonable profit, without which it was impossible for any operation to proceed. He only wished the architects were united in a similar way to that Federation. It would certainly be a distinct advantage to them. It no doubt tended to create better mutual relations with workmen, and also to the better progress of anything they had in hand. Mr. Dyson also responded. Mr. George Mellor (President of the Builders' Association) proposed "The Health of the Chairman," which was drunk with musical honours, and duly acknowledged.

THE BUILDING ACT AND FIRE PREVENTION IN THE CITY.—A meeting of the inhabitants of the Bread-street Ward was held at Cordwainers' Hall on Friday last week to discuss the County Council Building Act Amendment Bill. Alderman F. P. Alliston was voted to the chair. Mr. E. Clark moved a resolution to the effect that while willing to make proper provision for safety of life from fire, the meeting regarded the requirements of the Bill as arbitrary, unnecessary, and impracticable. Mr. Lindsay seconded the motion. Some discussion followed the contention of Mr. Hardy, a member of the Building Act Committee of the County Council, that the Bill was not half so drastic as had been made out. The resolution was carried, as was a second motion which expressed the opinion that the passing of the Bill would entail heavy costs, disputes, great inconvenience, and loss of business, and by reducing warehouse space would adversely affect the value of premises and lower the City's assessment. Mr. W. C. Boyd proposed a resolution to the effect that the Corporation of the City of London, as the local body, should deal with the question, and that the Lord Mayor should call an early meeting of the citizens of London, in the Guildhall, to oppose the Bill. He urged that the whole question was caused by the inefficiency of the appliances used by the County Council. The resolution was carried.—Similar meetings have also been held in Candlewick, Coleman-street, Cornhill, and Farringdon Within Wards, and the members of the City of London Tradesmen's Club have also had a meeting to consider the matter.

BUILDING BY LAWS REFORM ASSOCIATION.—The first general meeting of this Association was held at 45, Parliament-street, on the 5th inst., Lord Robert Cecil, K.C., in the chair. The chairman announced letters of regret from members unable to be present, including Lord Hylton, the Earl of Lytton, Lord Ormanston, the Countess of Warwick, Sir Godfrey Lushington, G.C.M.G., Sir Edmund Verney, the Right Hon. Gerald Balfour, M.P., the Hon. E. Pomeroy, the Hon. J. C. Cross, Mr. G. F. Watts, R.A., Mr. Douglas Freshfield, Mr. W. More-Molyneux, Rev. Canon Bury, Mr. C. S. Loch, Mr. John Martineau, Mr. George Darwin, F.R.S., Sir William Chance, Bart., submitted a report from the provisional council recommending articles of association for adoption. Considerable discussion followed, in which Mr. A. H. Clough, of Ringwood, Mr. Mark H. Judge, Mr. Arthur Newbold, of Brighton, Mr. E. D. Till, of Dartford, Mr. Thackeray Turner, Mr. H. G. Willink, of Reading, Mr. Stephen Rowland of Cranleigh, Mr. F. F. Kirby, of Winchester, and Mr. R. A. Read, Hon. Sec., took part. Ultimately the articles of association were adopted unanimously, the first of which provides that the objects of the Association shall be:—"(*a*) Where building by-laws or regulations are in force—To promote amendments so that official control of private buildings shall not extend beyond the demands of public health and safety, and thus to prevent encroachments on individual liberty. (*b*) Where it is intended to adopt such by-laws or regulations—To secure that those adopted shall satisfy the above conditions. (*c*) To assist as far as possible in suitable cases those who may be unduly interfered with by building by-laws or regulations." The following gentlemen were then elected as the first Council of the Association:—Mr. W. M. Acworth, Lord Robert Cecil, K.C., Sir William Chance, Bart., Mr. A. H. Clough, Mr. A. Graham, Mr. W. Henman (Birmingham), Mr. Mark H. Judge, Mr. E. Lutyens, Mr. Arthur Newbold, Dr. G. V. Poore, Mr. H. A. Powell, Mr. L. W. Ridge, Mr. R. W. Schultz, Mr. T. M. Shallcross (Liverpool), Mr. St. Loe Strachey, Mr. E. D. Till, Mr. Thackeray Turner, Mr. C. Turnor, Mr. H. J. Willink, and the Hon. Percy S. Wyndham. A vote of thanks to Lord Robert Cecil for presiding brought the proceedings to a close.

FAIR CONTRACTS.—A meeting of the Bradford and District Trades and Labour Council, called for the purpose of discussing the question of fair contracts, took place on the 6th inst. in the Trades Hall, Sunbridge-road, Bradford. The Secretary said that one of the difficulties which they had to deal with was why three parties, who were desirous, could not make such an understanding which would be binding on all parties. That was the crux of the whole situation. They possessed on the books of the Municipal Authority a Fair Contracts clause. That clause would satisfy the whole of the trade-unionists, provided that those who had the administration would carry it into effect. The clause was as drastic as it should be. The Executive felt that it was unfair that such a question should be made a party question, and that the sale of the human commodity should be kept above party jealousies. They felt that the trade unionists of Bradford had for too long been the football for the political teams, and asked that that meeting decide what course to adopt. If they could not enforce a fair contracts clause with a penalty, they should know it, and take steps to remedy it. Councillor F. W. Jowett thought that having now secured the opinion of three such eminent counsel, they should consider it very carefully before they set it aside. Considering that the power to determine a contract was placed with the Corporation, and a penalty clause disqualifying a contractor for five years if he broke his contract, he thought they should endeavour to try and see if it could not be worked. Mr. Shaw proposed a resolution to the effect that a committee be appointed to discuss the clause with the City Council, and endeavour to secure a clause which would be acceptable to the organised workers.—With reference to certain remarks which had been made as to the publishing of a "black list," the Chairman pointed out that they had been informed that it was actionable to publish a "black list," but it was within the rights of trade unionists to publish a "white" list, and in that way get out of the legal difficulty.—Mr. Theo. Warner advocated the establishment of a Works Department in Bradford, and the doing away with the employers.—A delegate, representing the Ironfounders' Society, proposed an amendment that no clause would be satisfactory that did not breach over the period of dispute and secure a standard rate of wages, and the penalising of a contractor for a breach of contract.—The amendment was withdrawn on the understanding that the matter be brought up again before the Council. The resolution was then adopted, and a committee appointed to carry it into effect.

HARTLEPOOLS MASTER BUILDERS' ASSOCIATION.—At the annual meeting of the Hartlepools Master Builders' Association, Mr. B. Dickinson presiding, it was stated that during 1902 the relations of the associated firms with their employees had been singularly free from friction, there being only one exception, in which case the Teeside Association was called upon to settle matters. The most important matter taken up during the year was the addition to the Federation rule, whereby each town would be called upon to take active part in all trade disputes in any town connected with the Federation, thus preventing the localising of disputes. Arrangements had been made with the local branch of the Operative Bricklayers' Society with a view to dispensing with labour work, by which it was hoped that the evil of speculative building by other than bonâ-fide tradesmen would be gradually stopped. It was a matter of regret that during 1902 the prosperity of the last few years had not been maintained, and at present, it was stated, there appeared little prospect of any im-

provement. Serious consideration would be given to the question of the re-adjustment of wages and working rules, with a view to lowering the cost of production, in order to encourage capitalists to invest. Mr. B. Dickinson was re-elected President; Messrs. J. Howe and J. W. Watt, Vice-Presidents; Mr. E. Moody, Secretary and Treasurer; and Messrs. Dickinson, Howe, Watt, Proud, Pearson, Beetham, and Stephenson, representatives to the Northern Federation.

NEW BUILDINGS FOR TECHNICAL EDUCATION.—The Technical Education Board of the London County Council report that steady progress is being made with the new buildings undertaken by the Council. The work for the L.C.C. Poplar Technical Institute, which is being erected by the Works Department, and that for the L.C.C. Brixton Technical Institute in Ferndale-road, the contract for which was entrusted to Mr. B. E. Nightingale in July last, is well advanced. Tenders are being invited for the extension of the Norwood Technical Institute, the work having been declined by the Works Committee, while the plans for the extension and repair of the L.C.C. Sydenham Technical Institute are in the hands of the architect. Mainly by the aid of the City Parochial Foundation, extensive new buildings are also being erected or about to be begun at the Northern Polytechnic, the Borough Polytechnic, the Battersea Polytechnic, and the South-Western Polytechnic in Manresa-road, Chelsea, while the City of London College is acquiring the lease of the adjoining premises, which will enable it almost to triple the amount of its work. The new buildings for the Hackney Technical Institute will, it is hoped, be practically completed by October next. These additions will enable the Board to meet next session the rapidly growing demand for trade and science classes, especially those connected with the engineering and building trades and the various chemical and electrical industries.

PIER, SUNDERLAND.—The new Roker pier—the first part of the scheme undertaken by the River Wear Commissioners for the further improvement of the harbour at Sunderland—is nearly completed. The engineer is Mr. H. H. Wake.

MEMORIAL SCREEN, KNOTTY ASH CHURCH.—A memorial screen has just been erected in Knotty Ash Church, Lancashire. It was designed by Mr. Charles E. Deacon, architect, of Liverpool, and is fifteenth century in style. It is constructed entirely of English oak. The work has been executed by Messrs. Harry Hems & Sons, of Exeter. The four parclose screens, the reredos, pulpit, and organ-case are also the handiwork of Messrs. Hems & Sons, carried out from Mr. Deacon's designs.

LEGAL.

EXPENSES UNDER THE PRIVATE STREET WORKS ACT, 1892.

THE case of Surtees *v* Woodhouse came before the Court of Appeal, composed of Lords Justices Vaughan Williams, Stirling, and Mathew, on the 7th inst. for judgment on the appeal of the defendant from a judgment of Mr. Justice Walton in the Kings Bench Division.

In this case the plaintiff, a widow, the lessee of a house known as Somersham, Ray Park, Maidenhead, sought to recover from the defendant, her sub-lessee, the sum of 60*l*, the cost apportioned to the premises in respect of certain private street improvement works carried out by the Corporation of Maidenhead. The plaintiff had paid these expenses to her superior landlord on the ground that they came within the term "outgoings" in a covenant in the superior lease by which the lessees (the plaintiff and her husband) jointly and severally covenanted that they would during the term pay the rent reserved, and would pay and bear all present and future rates, taxes, duties, assessments, and outgoings charged upon the premises or the owner or occupier in respect thereof. The whole question raised by the case was whether the defendant, under the terms of the sub-demise to him, was liable to indemnify the plaintiff in respect of such payment. The sub-lease of the premises to the defendant was dated November 30, 1899, and therein defendant covenanted that he would pay the rent and observe and perform all the covenants and conditions contained in the indentures of lease on the lessees part to be observed and performed, and would keep indemnified the lessor from and against the covenants and conditions and all claims and demands in respect thereof. The Corporation of Maidenhead commenced the works in question in September, 1899, and completed them on October 7, the final apportionment being made on December 11, 1899. Mr. Justice Walton held that though the effect of the Private Street Works Act, 1892, was to make the amount of the apportioned expenses a charge on the premises as from the date of the completion of the works, and not merely as from the date of the final apportionment, still the expenses became due and payable after November 30, 1899. He was of opinion, on the true construction of the covenant, defendant covenanted to pay all liabilities which became due after the commencement of the term, even though the outgoings arose in respect of an obligation which came into existence in October, 1899. He accordingly gave judgment for the plaintiff for the amount claimed—hence the present appeal of the defendant.

In the result their Lordships allowed the appeal, holding that the defendant was not by the covenant under any obligation to pay charges to which the property had been assessed for private street works, but which had not become payable.

Judgment was accordingly entered for the defendant.

Mr. Danckwerts, K.C., Mr. Scarlett, and Mr. Sinclair Cox appeared for the appellant; and Mr. J. Eldon Bankes, K.C., Mr. E. Morton, and Mr. H. Sturgess for the respondent.

DAMAGE TO BUILDINGS THROUGH RAILWAY TUNNELLING.

IN the King's Bench Division on the 5th inst. the hearing was resumed of the case of Dawson *v.* The Great Northern and City Railway Company. This was an action by the plaintiff, Mrs. Dawson, a widow, carrying on business as a draper in the City-road and East-road, London, to recover from the defendants damages for injury to her premises and consequent loss in her business caused by the tunnelling work carried on by the defendant Company for the purpose of constructing their tube railway. The defendants by their pleadings denied that the damage was due to their tunnelling operations, but in the course of the plaintiff's case admitted liability. The case therefore resolved itself into an action for damages (the case was fully reported in last week's issue of the *Builder*).

Sir Edward Clarke, K.C, Mr. Harry Dobb, and Mr. R. J. White appeared for the plaintiff; and Mr. McCall, K.C., Mr. Geo. Cave, Mr. Hutchinson, and Mr. W. P. Horton for the defendant Railway Company.

The plaintiff's case having concluded, Mr. McCall, on behalf of the defendants, said that he would not address the Court at that stage, but would at once proceed to call his witnesses. Accordingly

Mr. Douglas Young, of the firm of Douglas Young & Co., valuers and surveyors, and himself a valuer to the Board of Trade, examined, said he had had fourteen years' experience in the construction of tube railways, and was surveyor to the City and South London Railway. He had frequently examined the plaintiff's premises. He estimated that the outside walls were about sixty years old. Since they had been built the basement had been lowered 3 ft. or 4 ft. down to the bottom course of the footing. The cracks in the premises were not of a serious character, and could be dealt with by cutting out and rebonding. The cracks were not inconsistent with the age of the building, the general character of which was slight. There was evidence of movement from time to time, and evidence of old movement was apparent all over the building. He had carefully watched the building, and he thought that now all movement had ceased. As a practical man, having regard to the stability of the walls he should only remove a certain amount of brickwork and build it up again. He was of opinion that the different levels of the building were not due to recent movement, but indicated an old movement of the house—a movement such as was generally to be found in that locality. There was evidence that the hanging over and twisting of the walls was caused by the gutting of the premises in 1872 for the purpose of enlarging the amount of space available. There was no indication of any disturbance of cornices and fittings inside which would indicate that the twist had not occurred within the last few years. Underpinning was not necessary, nor was it necessary to pull down the walls. In regard to the whole of the tube railways in London he knew of no case in which underpinning was necessary. He estimated that 500*l*. would amply cover the cost of the reinstatement of the premises. He thought that was a liberal figure. If the work were carried out in the way he suggested there would be no large interference with the plaintiff's business. The work would be quite sectional, and so would the interference be. The necessity of sleeping or mealing out the staff would therefore be a comparatively small matter. Two or three months would be a sufficient time to carry out the work. If the stock was properly cared for it would not be damaged. Another 500*l*. would be quite adequate for the purposes of providing for any damage to stock and disturbance of the business. There was no need to take down any of the walls of the premises.

Cross-examined by Sir Edward Clarke: The fact that a house with overhanging walls was situate above a railway tunnel was a coincidence. There was scarcely a house in the district which was not out of plumb.

Mr. Leslie R. Vigers, an architect and surveyor, and a member of the firm acting for the Central London Railway, examined, said he considered that the best way to deal with the damage in the plaintiff's house was by cutting out the cracks and rebonding. Taking down the walls was not necessary.

Mr. Edward A. Grüning also gave evidence in support of the defendants' case. He said it was absolutely unnecessary to pull down and rebuild the walls. Moreover, it was a very dangerous thing to do, because it would disturb the stability of the outer walls and was unnecessary from the point of view of expense. It was obviously more dangerous than cutting out and rebonding and would involve more serious interference with business, as it would take longer to do. In such a case cutting out and rebonding was an efficient remedy.

On the 6th inst., further evidence was called with a view to show that the damage to the plaintiff's premises by the tunnelling operations of defendants was not of a substantial nature, and could be repaired for a much smaller sum than the plaintiff claimed. Evidence was also called to show that the estimates of plaintiff's advisers as to the loss of profits during the execution of the repairs were excessive.

Mr. McCall then addressed the jury on behalf of the defendants. He described the plaintiff's claim as an inflated and preposterous one. The necessary work to repair the plaintiff's premises could be carried out for about 500*l*., and 1,500*l*. would cover all damage for loss of business.

Sir Edward Clarke, in replying upon the whole case, contended that the figures put forward by the plaintiff were moderate, and indicated the damages she was entitled to.

His Lordship having summed up, the jury assessed the damages under the following heads:—(1) Amount for taking the subsoil occupied by the tunnel, 50*l*.; (2) structural damage, 2,000*l*.; and (3) damage to trade and stock, 2,100*l*.; total, 4,150*l*.

Mr. Dobb asked the learned judge to enter judgment.

Mr. McCall said the learned judge had no power to enter a judgment of the High Court because the proceedings were in the form of an interpleader issue.

Mr. Dobb agreed that the verdict must be enforced by an action, but said that the learned judge had power to enter judgment in the same way as the under-sheriff did in compensation cases.

His Lordship said he would give judgment in the sense in which the word was used in the Lands Clauses Act.

Judgment was entered accordingly.

BUILDERS, ARCHITECTS, AND COMMISSION.

AT Lambeth County Court, on the 5th inst., Mr. H. J. Boulter, builder and house decorator, late of Sancroft-street, Kennington-cross, but now carrying on business at Merton, sued Mr. Albert C. Symes, a Brixton surveyor and architect, for 8*l*. commission. Plaintiff said in 1901 he was engaged by a Mr. Reed to build two houses in Shoreditch. Before the contract was signed he introduced defendant to Mr. Reed, and the latter engaged Symes as architect. Defendant promised to pay 8*l*. or 10*l*. to witness for his services. In reply to Judge Emden, plaintiff said he failed to see anything wrong in the transaction. It was quite usual in the trade. Business men lived by introducing business in this way to each other. Judge Emden: I am not here to preach, or to teach you morality, but I am astounded to hear what you say. I see you actually sent a formal invoice for this commission. According to you an outrageous state of affairs exists. Defendant denied the alleged agreement to pay commission, and swore no such custom existed in the trade. He heard nothing of the claim until he enforced a penalty of 50*l*. against plaintiff. Judgment was entered for defendant, with costs. Judge Emden said there appeared to be a good deal behind the case.—*Daily News*.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

741 of 1902.—T. R. BARHAM and J. H. WILLIAMS: *Means for Holding Glass Sheets and the Like for Structural Purposes.*

A sash-bar adapted to be formed by rolling, to be used with fixing bolts, of sufficient strength without further support for use on a glazed or similar structure and constructed with a dovetailed or partially closed recess which will secure the heads of the fixing bolts without the necessity for forming holes in the bar.

876 of 1902.—C. BROWN: *Automatic Sewer or Drain-flushing Apparatus.*

In connexion with apparatus for flushing sewers or for automatically discharging liquids through several outlets in regular rotation, the use of a revolving disc, having an aperture, which is automatically brought in rotation over one or other of several openings leading to, or connected with several sewers desired to be flushed rotatively, the solid part of which disc covers or seals the remaining openings to such sewers.

1,035 of 1902.—W. P. THOMPSON (H. Sulzbach & Co.): *Manufacture of Metal Wall Covering Tablets or Tiles having Coloured Enamelled Surfaces.*

A method of enamelling metal plates consisting in coating the plates with a mixture of zinc white or oil varnish, then drying them, coating the plates

* All these applications are in the stage in which opposition to the grant of a Patent upon them can be made.

thus dried with white dial varnish and again drying them, then rubbing said plates with fine pumice stone mixed with water, then printing them with permanent colours.

2,770 of 1902.—J. SIM: *Grates used for Warming the Apartments of Dwelling Houses and other Buildings.*

The grate operates in the following manner:—The coal or other combustible is burnt in the grate in the usual manner, the products of combustion passing into the chimney through a flue. In due course, the whole of the grate becomes more or less heated, and such heat radiates in all directions into the room and also heats the air which comes in contact with it. In addition, the air of the room, or if desired, air from outside passes in by air inlets, or by a flue led to the hollow spaces below the grate into the hollow back and sides up past ribs, and out again into the room through outlets: or another room may be heated by using pipes to conduct such heated air into it.

5,901 of 1902.—H. C. NIELSEN: *Chimney Tops.*

This consists in the arrangement that the part of the chimney top which rests upon the brick-built chimney in the house reaching to the ridge of the roof, is surrounded by a hood connected at the top with the said part, but for the rest separated from same by a groove, the said groove reaching completely round the inner part, and so high up into the chimney top that its uppermost points lie higher than the lower edge of the hood.

20,952 of 1902.—G. CLARK and T. TURNER. *Construction of Joiners' Cramps.*

A joiners' cramp, provided with serrations upon its back edge, and a sliding jaw, provided with a recess containing a fixed serrated block to engage with those upon the cramp, and having room to automatically disengage same.

22,350 of 1902.—G. R. TELLANDER.: *Locking or Arresting Devices for Self Closing Ventilators.*

Locking or arresting devices for self-closing ventilators, in which a pawl is pivotally fixed to the ventilator frame and adapted to engage a toothed segment fixed to the valve plate of the ventilator, consisting in the arrangement that the toothed segment is of such length or at its ends provided with such recesses that the said pawl will on account of gravity take a downward position when the valve-plate of the ventilator has been turned into either of its end positions.

24,699 of 1902.—P. M. JUSTICE (Pressed Prism Plate Glass Co.): *Prismatic Glass Plates for Windows, Daylight Reflectors, and Refractors, and the Like.*

This consists in the combination in a prismatic illuminator of a series of prisms and a series of wires, enclosed in the neutral parts of the structure, and a second series of wires embedded in the structure at an angle to the first set.

17,009 of 1902. — LAMBERT BOSSON and LOUIS BOSSON: *Lever Compression Mechanism for Brick Presses and the Like.*

A mechanical compression contrivance for brick presses and the like, in which the lowering of the operating lever effects the gradual raising of the point at which the resistance is applied by the bringing forward of the fulcrum into the vertical plane of compression, the result being a gradual compression on a point which is almost invariable, a second push of the lever, when the compression has reached its maximum, being intended to produce a shock against an intermediate organ for removing the objects from the mould.

4,441 of 1902.—T. A. SPENCER: *Chimney Cowls.*

A chimney cowl consisting of a tube provided with air inlets and a conical deflector at about its middle part and with an internal cone in its upper part, having an external conical terminal.

1,408 of 1902.—F. M. DAVID: *Scaffolding.*

A double socket adapted to have two scaffold poles or putlogs passed through it, one forming the standard and the other the ledger, and to support the said poles or putlogs in a crossed suitable position for use in a scaffold.

3,414 of 1902.—G. DAVIES (J. Peckover): *Reciprocating Machines for Stone Cutting.*

This consists in the combination in a stone-cutting machine of a supporting frame, a carrier frame supported thereon, slides enclosed on all sides within said carrier frame, and a saw frame having runners projecting through an opening in the lower face of the carrier frame, constructed to operate on said slides, with means for reciprocating the saw frame.

5,392 of 1902.—J. H. MCLEAN: *Production of Artificial Blocks and Slabs.*

The object of this invention is to provide a sanitary, noiseless, and non-slipping sett or block for road paving and for other purposes. In carrying out this invention any suitable material, such as granite chippings, may be employed, but preferably the tailings from gold mining, which now form a refuse product, and this material is ground up to a fine state. A suitable binding material, such as Portland cement, is then taken, and this material is also ground to a fine state and the cement is mixed in the proportion of one part to three parts of the ground tailings with the tailings dry. The mixture is then brought to a plastic state by adding thereto a small quantity of silicate of soda either alone or with a small proportion of water, and the plastic mass is placed in suitably formed moulds and the same is submitted to pressure. When setts are to be produced, the mould is so formed that a small bevel will be left all round the top edge of the sett, and means are also provided whereby a roughened surface will be given to the top of the sett. The blocks, when removed from the mould, are stacked in the open air to weather or harden, and will be ready for use as roadway paving in a few days.

MEETINGS.

FRIDAY, FEBRUARY 13.

Institution of Civil Engineers (Students' Meeting).—Mr. H. A. Bartlett on "The Construction and Setting-out of Tunnels in the London Clay." 8 p.m.

King's College, Strand.—Mr. A. Young, R.P., on "Sanitary Plumbing." 7.30 p.m.

SATURDAY, FEBRUARY 14.

Junior Institution of Engineers.—Eighteenth Anniversary Dinner, at the Hotel Cecil. The President, Colonel E. Raban, C.B., R.E., in the chair. 7 p.m.

MONDAY, FEBRUARY 16.

Royal Institute of British Architects.—Mr. Basil Champneys, B.A., on "College Planning." 8 p.m.

Surveyors' Institution (Junior Meetings).—Further discussion of a paper on "Dilapidations," by Mr. A. T. Latham. 7 p.m.

London Institution.—Mr. R. E. Fry on "The Art of Piero di Cosimo," illustrated. 5 p.m.

Liverpool Architectural Society (Incorporated).—Mr. I. P. Abercrombie on "Leonardo da Vinci." 6 p.m.

Society of Arts (Cantor Lectures).—Mr. Julius Hübner on "Paper Manufacture."—III. 8 p.m.

Northern Architectural Association.—R.I.B.A. Prize Drawings, &c., on view.

TUESDAY, FEBRUARY 17.

Institution of Civil Engineers.—1. Paper to be further discussed, "The Manufacture and Efficiency of Armour-piercing Projectiles," by Mr. David Carnegie. 2. Paper to be read, time permitting, "Mechanical Handling of Material," by Mr G. F. Zimmer. 8 p.m.

Society of Designers (Clifford's Inn).—Mr. F. Hamilton Jackson on "Intarsia and Marquetry: the History, Principles, and Practice of the Art. 8 p.m.

Society of Arts (Applied Art Section).—Mr. George W. Eve, A.R.E., on "Heraldry in Decoration." 8 p.m.

Glasgow Architectural Association.—Mr. H. O. Tarbolton on "Plaster Work." 8 p.m.

WEDNESDAY, FEBRUARY 18.

Architectural Association Camera and Cycling Club.—Demonstration on "The Carbon Process," by the Autotype Co.

St. Paul's Ecclesiological Society.—A paper entitled "Notes on the Brasses of Kent" (concluding part), will be read by Mr. Mill Stephenson, F.S.A. 8 p.m.

British Archæological Association.—Paper entitled "Notes on Some Cathedrals and Churches in France," by Mr. Andrew Oliver. 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Edinburgh Architectural Association.—Mr. A. Hunter Crawford on "The Building of a House." III. Illustrated. 8 p.m.

Society of Arts.—Mr. H. Dalziel on "Three-Colour Printing." 8 p.m.

Institution of Civil Engineers.—Students' visit to the works of the Kew Bridge, in course of construction. (Assemble at the Bridge. Train from Westminster Bridge Station to Gunnersbury, 1.42 p.m.)

THURSDAY, FEBRUARY 19.

London Master Builders' Association.—Dinner in "The Empire Hall," Trocadero Restaurant, Piccadilly-circus, W. 6.30 p.m.

Society for the Encouragement of the Fine Arts.—Mrs. Ray S. Lineham on "The Spirit of Ancient Egypt." (Lantern Illustrations.) 8 p.m.

Carpenters' Company (Free Lectures on Matters Connected with Building).—Professor R Elsey Smith on "Ancient Rome in 1903." 8 p.m.

Architectural Association of Ireland.—Demonstration on Cast Iron at works of Messrs. Tonge & Taggart, Windmill-lane, Sir John Rogerson's Quay. 4.30 p.m.

FRIDAY, FEBRUARY 20.

Architectural Association.—Mr. Silvester Sparrow on "The Stained Glass of the Future." 7.30 p.m.

Royal Institution.—Principal E. H. Griffiths, F.R.S., on "The Measurement of Energy.' 9.m.

Surveyors' Institution.—Annual dinner, Empire Hall, Trocadero Restaurant, Piccadilly-circus. 7 p.m.

Institution of Mechanical Engineers.—Fifty-sixth annual general meeting. Papers to be read and discussed together:—"Hydraulic Experiments on a Plunger Pump," by Professor John Goodman, and "Experiments on the Efficiency of Centrifugal Pumps," by Mr. Thomas E. Stanton, D.Sc. 8 p.m.

Birmingham Architectural Association.—Mr. Edgar Wood on "Experiences."

SATURDAY, FEBRUARY 21.

Architectural Association.—Second spring visit, to the new post office and savings bank buildings, Addison-road, 2.30 p.m. Annual supper of the Camera and Cycling Club, Holborn Restaurant. 7 p.m.

Incorporated British Institute of Certified Carpenters.—Visit to the Works' Department of the London County Council, Belvedere-road, S.E. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

Jan. 30.—By H. RICHARDS & SON (at Wimborne)

Pamphill, Dorset.—Cowgrove, freehold farmhouse and 46½ a.	£2,300
Hurn Cottage and 1¾ a., f.	400
Corfe Mullen, Dorset.—Bear Mead allotment, 2 a. 1 r. 23 p., f.	230
West Parley, Dorset.—Heath Land allotment, 13 a. 0 r. 35 p., f.	150

Feb. 2.—By G. A. WILKINSON & SON.

City of London.—68, Farringdon-st. (s), area 860 ft., f., y.r. 200*l.*	4,625
St. Luke's.—66, Goswell-rd. (warehouse), u.t. 51 yrs., g.r. 50*l.*, y.r. 255*l.*	1,400

Feb. 3.—By C. H. BROWN.

Pimlico.—23, Moreton-pl., u.t. 25 yrs., g.r. 9*l.*, e.r. 65*l.*	475
New Malden, Surrey.—1, Acacia Villas, f., e.r. 26*l.*	235

By DEBENHAM, TEWSON, & CO.

Brixton.—Beechdale-rd., f.g.r.'s 106*l.*, reversion in 88 yrs.	2,860
Beechdale-rd., f.g.r. 8*l.*, reversion in 88 yrs.	230
St. John's Wood.—31, Acacia-rd., u.t. 32 yrs., g.r. 8*l.*, y.r. 52*l.*	425

By E. H. HENRY.

Wandsworth.—28 and 30, St. Ann's-rd., f., y.r. 60*l.*	1,085

By FRED. VARLEY & SON.

Holloway.—51, Isledon-rd., u.t. 48½ yrs., g.r. 9*l.*, e.r. 48*l.*	410
Finsbury Park.—13, Prah-rd., u.t. 74 yrs., g.r. 5*l.* 10s., e.r. 42*l.*	400
1, Laura-ter., u.t. 73 yrs., g.r. 7*l.*, e.r. 45*l.*	425
Harringay.—69 and 71, Umfreville-rd., u.t. 87 yrs., g.r. 14*l.*, y.r. 74*l.* 16s.	760
Tottenham.—52 to 58 (even), Cornwall-rd., u.t. 51 yrs., g.r. 21*l.*, w.r. 123*l.* 10s.	470

By DAVID BURNETT & CO.

City of London.—19 and 21, Ludgate-hill (s), a profit rental of 350*l.*, increasing to 500*l.*, for 22½ yrs.	3,225
Muswell Hill.—Alexandra Park-rd., Holmhurst, u.t. 95½ yrs., g.r. 10*l.* 10s., y.r. 52*l.* 10s.	570

By G. HASLETT (at Masons' Hall Tavern).

Charing Cross.—Warwick House-st., The Two Chairmen p.-h., u.t. 32½ yrs., y.r. 150*l.*, with goodwill	12,00

February 4.—By GEORGE BILLINGS.

Hoxton.—43, Grange-st., u.t. 34 yrs., g.r. 5*l.* 5s., y.r. 31*l.*	325
Holloway.—17, Miranda-rd., u.t. 48½ yrs., g.r. 12*l.*, y.r. 47*l.*	315
Hackney.—65 and 67, Frampton Park-rd., u.t. 35 yrs., g.r. 10*l.*, y.r. 70*l.*	590

By DUNN, SOMAN, & COVERDALE.

Billingshurst, Sussex.—Hillside and The Wildens, area 24 a., f., y.r. 40*l.*	1,250

By E. HOLSWORTH.

Homerton.—29, Ballance-rd., u.t. 57 yrs., g.r. 4*l.*, w.r. 35*l.* 2s.	260
Edmonton.—74, Croyland-rd., f., w.r. 29*l.* 18s.	300

By MARK LIELL & SON.

Bow.—512, 514, and 516, Old Ford-rd. (s), u.t. 52 yrs., g.r. 13*l.* 13s., w.r. 107*l.* 18s.	500
Bethnal Green.—69, Three Colt-la., and 5, Abingdon-st., u.t. 22 yrs., g.r. 10*l.*, w.r. 55*l.* 18s.	150

February 5.—By DRIVERS.

Finsbury Park.—41, St. Thomas-rd., u.t. 64½ yrs., g.r. 6*l.*, e.r. 40*l.*	375

By SIM & RANDALL.

Manor Park.—642 to 654 (even), Romford-rd. (s), f., y.r. 220*l.*	4,705

February 6.—By JONES, LANG, & CO.

Whitechapel.—Wellclose-sq., Joel Emanuel Almshouses, area 9,0.0 ft., f.	5,110

By DRYSDALE, NURSE, & CO.

Stamford Hill.—74, Daleview-rd., u.t. 55½ yrs., g.r. 6*l.* 6s., p.	320
17, Candler-st., u.t. 85 yrs., g.r. 5*l.* 5s., p.	180
Clapton.—1, Colenso-rd., u.t. 80 yrs., g.r. 6*l.*, p.	250

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 14 0	per 1,000 alongside, in river.	
Rough Stocks and Grizzles	1 11 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 7 6	,,	at railway depôt
Red Wire Cuts	1 12 0	,,	,, ,,
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing	5 0 0	,,	,, ,,
Best Blue Pressed Staffordshire	4 5 0	,,	,, ,,
Do. Bullnose	4 11 0	,,	,, ,,

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£	s.	d.			
Best Stourbridge Fire Bricks	4	8	0	per 1,000 at railway depot.		
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers.....	13	0	0	,,	,,	,,
Headers	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	17	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers..	16	0	0	,,	,,	,,
One Side and two Ends.....	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamfered, Squints.....	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers..	14	0	0	,,	,,	,,
One Side and two Ends.....	15	0	0	,,	,,	,,
Two Sides and one End	15	0	0	,,	,,	,,
Splays Chamfered, Squints.....	14	0	0	,,	,,	,,
Second Quality White and Dipped Salt Glazed	2	0	0	,,		less than best.
Thames and Pit Sand			7	0	per yard, delivered.	
Thames Ballast			6	0	,,	,,
Best Portland Cement			30	0	per ton, delivered.	
Best Ground Blue Lias Lime..			21	0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 10s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s.	d.			
Ancaster in blocks	1	11	per ft. cube, deld. rly. depôt.		
Bath ,, ...	1	7	,,	,,	
Farleigh Down Bath ..	1	8	,,	,,	
Beer in blocks	1	6	,,	,,	
Grinshill ,, ...	1	10	,,	,,	
Brown Portland in blocks	2	2	,,	,,	
Darley Dale in blocks..	2	4	,,	,,	
Red Corsehill ,,	2	5	,,	,,	
Closeburn Red Freestone	2	0	,,	,,	
Red Mansfield ,,	2	4	,,	,,	

YORK STONE—*Robin Hood Quality.*

	s.	d.			
Scappled random blocks	2	10	per ft. cube, deld. rly. depôt.		
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per foot super.	,,	
6 in. Rubbed two sides Ditto, Ditto	2	6	,,	,,	
3 in. Sawn two sides slabs (random sizes)..	0	11½	,,	,,	
2 in. to 2½ in. Sawn one side slabs (random sizes)	0	7½	,,	,,	
1½ in. to 2 in. ditto, ditto	0	6	,,	,,	

BEST HARL YORK—

Scappled random blocks	3	0	per ft. cube	,,	
6 in. sawn two sides, landings to sizes (under 40 ft. sup.)	2	8	per ft. super.	,,	
6 in. Rubbed two sides Ditto	—		,,	,,	
3 in. sawn two sides slabs (random sizes)	1	2	,,	,,	
2 in. self-faced random flags.....	0	5	,,	,,	
Hopton Wood (Hard Bed)	in blocks		2	3	per ft. cube.
,, ,, ,,	6 in. sawn both sides landings		2	7	per ft. super. deld. rly. depôt.
,, ,, ,,	3 in. do.		1	2½	,, ,,

SLATES.

in.	in.	£	s.	d.		
20	10 best blue Bangor..	13	2	6	per 1000 of 1200 at rly.dep.	
20	12 ,, ,, ,,	13	17	6	,,	,,
20	10 best seconds ,,	12	15	0	,,	,,
20	12 ,, ,, ,,	13	10	0	,,	,,
16	8 best ,,	7	0	0	,,	,,
20	10 best blue Portmadoc	12	5	0	,,	,,
16	8 best blue Portmadoc	6	0	0	,,	,,
20	10 best Eureka unfading green....	15	0	0	,,	,,
20	12 ,, ,,	16	10	0	,,	,,
18	10 ,, ,,	11	10	0	,,	,,
16	8 ,, ,,	8	7	6	,,	,,
20	10 permanent green	10	10	0	,,	,,
18	10 ,, ,,	9	0	0	,,	,,
16	8 ,, ,,	6	5	0	,,	,,

TILES.

	s.	d.			
Best plain red roofing tiles..	42	0	per 1,000, at rly. depôt.		
Hip and valley tiles....	3	7	per doz.	,,	,,
Best Broseley tiles	50	0	per 1,000	,,	,,
Do. Ornamental Tiles	52	6	,,	,,	,,
Hip and valley tiles....	4	0	per doz.	,,	,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000	,,	,,
Do. ornamental Do.	60	0	,,	,,	,,
Hip tiles	4	0	per doz.	,,	,,
Valley tiles.....	3	0	,,	,,	,,
Best Red or Mottled Staffordshire Do. (Peakes)	51	0	per 1,000	,,	,,
Do. Ornamental Do.	54	6	,,	,,	,,
Hip tiles	4	1	per doz.	,,	,,
Valley tiles.....	3	8	,,	,,	,,
Best "Rosemary" brand plain tiles	48	0	per 1,000	,,	,,
Do. Ornamental Do.	50	0	,,	,,	,,
Hip tiles	4	0	per doz.	,,	,,
Valley tiles	3	8	,,	,,	,,

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	15	10	0	16	10	0
Deals: best 3 by 9.....	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	11	10	0	12	10	0
Battens: best 2½ by 6 and 3 by 6 ..	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	,,	,,	,,
2 in. by 4 in. and 2 in. by 6 in. ..	9	0	0	9	10	0
2 in. by 4½ in. and 2 in. by 5 in. ..	8	10	0	9	10	0
Foreign Sawn Boards—						
1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	,,		
Fir timber: Best middling Danzig or Memel (average specification	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.).....	3	0	0	3	10	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft. average)..	3	5	0	3	15	0
JOINERS' WOOD.	At per standard.					
White Sea: First yellow deals, 3 in. by 11 in.....	23	0	0	24	0	0
3 in. by 9 in.	21	0	0	22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	18	10	0
Second yellow deals, 3 in. by 11 in.	18	10	0	20	0	0
,, ,, 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.....	18	0	0	19	10	0
Battens.....	13	10	0	15	0	0
Second yellow deals, 3 in. by 11 in.....	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens.....	11	10	0	12	10	0
Third yellow deals, 3 in. by 11 in.....	13	10	0	14	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg :—						
First white deals, 3 in. by 11 in.	14	10	0	15	10	0
,, ,, 3 in. by 9 in.	13	10	0	14	10	0
Battens.....	11	0	0	12	0	0
Second white deals 3 in. by 11 in.	13	10	0	14	10	0
,, ,, ,, 3 in. by 9 in.	12	10	0	13	10	0
,, ,, ,, battens.....	9	10	0	10	10	0
Pitch-pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes ..	33	0	0	upwards.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine Oddments	20	0	0	22	0	0
Kauri Pine—Planks, per ft. cube..	0	3	6	0	4	6
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	2	6	0	3	6
Small ,, ,, ...	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube ..	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	7	0	0	8
¼ in. do. do.	0	0	6½	-	-	-
Dry Mahogany—						
Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	16	10	0	20	0	0
American Whitewood Planks—						
Per ft. cube	0	4	0	-	-	-
Prepared Flooring—	Per square.					
1 in. by 7 in. yellow, planed and shot.....	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched.....	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched.....	0	16	0	1	1	6
1 in. by 7 in. white, planed and shot.....	0	11	6	0	13	6
1 in. by 7 in. white, planed and matched.....	0	12	0	0	14	0
1¼ in. by 7 in. white, planed and matched.....	0	14	6	0	16	6
¾ in. by 7 inch yellow matched and beaded or V-jointed boards	0	11	0	0	13	6
1 in. by 7 in. do. do. do.	0	14	0	0	18	0
¾ in. by 7 in. white do. do.	0	10	0	0	11	6
1 in. by 7 in. do. do. do.	0	11	6	0	13	6

6-in. at 6d. to 9d. per square less than 7-in.

JOISTS, GIRDERS, &c.

	In London, or delivered. Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0	7	5	0
Compound Girders ,, ,,	8	2	6	9	5	0
Angles, Tees and Channels, ordinary sections	7	17	6	8	17	6
Flitch Plates	8	5	0	8	15	0
Cast Iron Columns and Stanchions, including ordinary patterns	7	2	6	8	5	6

METALS.

	Per ton, in London £	s.	d.	£	s.	d.
IRON—						
Common Bars.....	7	15	0	8	5	0
Staffordshire Crown Bars, good merchant quality	8	5	0	8	15	0
Staffordshire "Marked Bars" ..	10	10	0	-	-	-
Mild Steel Bars	9	0	0	9	10	0
Hoop Iron, basis price.....	9	5	0	9	10	0
,, ,, galvanised.....	16	0	0	.	.	.

(* And upwards, according to size and gauge.)

Sheet Iron, Black.—						
Ordinary sizes to 20 g.	10	0	0	-	-	-
,, ,, to 24 g.	11	0	0	-	-	-
,, ,, to 26 g.	12	10	0	-	-	-
Sheet Iron, Galvanised, flat, ordinary quality—						
Ordinary sizes 6 ft. by 2 ft. to 3 ft. to 20 g.....	12	15	0	-	-	-
,, ,, 22 g. and 24 g.	13	5	0	-	-	-
,, ,, 26 g.....	14	5	0	-	-	-

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
Sheet Iron, Galvanised, flat, best quality:—						
Ordinary sizes to 20 g.....	16	0	0	-	-	-
,, ,, 22 g. and 24 g.	16	10	0	-	-	-
,, ,, 26 g.....	18	0	0	-	-	-
Galvanised Corrugated Sheets:—						
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12	15	0	-	-	-
,, ,, 22 g. and 24 g.	13	5	0	-	-	-
,, ,, 26 g.....	14	5	0	-	-	-
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12	0	0	-	-	-
,, ,, 22 g. and 24 g.	13	0	0	-	-	-
,, ,, 26 g.	14	5	0	-	-	-
Cut nails, 3 in. to 6 in.	9	5	0	9	15	0

(Under 3 in. usual trade extras.)

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3 lbs. & up.	14	2	6	-	-	-
Pipe in coils	14	12	6	-	-	-
Soil pipe'.....	17	2	6	-	-	-
Compo Pipe	17	2	6	-	-	-
ZINC—Sheet—						
Vieille Montagne ..... ton	25	0	0	-	-	-
Silesian	24	15	0	-	-	-
COPPER—						
Strong Sheet ..... per lb.	0	0	10	-	-	-
Thin ..... ,,	0	0	11	-	-	-
Copper nails ..... ,,	0	0	11	-	-	-
BRASS—						
Strong Sheet..... ,,	0	0	9	-	-	-
Thin ,, ... ,,	0	0	10	-	-	-
TIN—English Ingots ..... ,,	0	1	4	-	-	-
SOLDER—Plumbers' ..... ,,	0	0	6½	-	-	-
Tinmen's ..... ,,	0	0	8½	-	-	-
Blowpipe ..... ,,	0	0	9½	-	-	-

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d.	per ft.	delivered.
,, fourths.....	1¾d.	,,	,,
21 oz. thirds	3½d.	,,	,,
,, fourths.....	2¾d.	,,	,,
26 oz. thirds	4d.	,,	,,
,, fourths.....	3½d.	,,	,,
32 oz. thirds	5d.	,,	,,
,, fourths.....	4½d.	,,	,,
Fluted sheet, 15 oz.	3d.	,,	,,
,, 21 oz.	4d.	,,	,,
⅛ Hartley's Rolled Plate	1¾d.	,,	,,
3/16 ,, ,, ,, ...	2d.	,,	,,
¼ ,, ,, ,, ...	2½d.	,,	,,

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes or barrels..	per gallon	0	2	3
,, ,, ,, in drums.....	,,	0	2	7
Boiled ,, ,, in pipes or barrels..	,,	0	2	5
,, ,, ,, in drums.....	,,	0	2	9
Turpentine, in barrels	,,	0	3	6
,, in drums	,,	0	3	8
Genuine Ground English White Lead	per ton	20	10	0
Red Lead, Dry	,,	20	0	0
Best Linseed Oil Putty.....	per cwt.	0	8	0
Stockholm Tar.....	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak.....	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	6
Superfine Hard-drying Oak, for Seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

TO CORRESPONDENTS.

A. F.—H. C. J.—S. S. P.—C. & W. (Amounts should have been stated). J. L. (Below our limit).

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Laying Out Caldicott Park (about 9½ acres)	Rugby U.D.C.	20*l.* and 5*l.*	Mar. 17
*Proposed New Hospital	Manchester, &c. Hospital Commit.	75*l.*, 50*l.*, and 25*l.*	April 30
*Designs for Public Offices and Town Hall	Acton Borough Council	50*l.* each to Selected Competitors	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Sewer (2 miles), Ladysbridge Asylum	Banffshire Lunacy Board	Jenkins-Marr, Civil Engineer, 16, Bridge-street, Aberdeen	Feb. 14
Street Works, Grenville-road (Section 4)	Plymouth Corporation	J. Paton, Borough Surveyor, Town Hall, Plymouth	Feb. 16
Church, Lincoln	.....	C. Hodgson Fowler, Architect, Durham	Feb. 17
Houses at Asylum, Lenzie	Glasgow District Lunacy Board	J. R. Motion, 266, George-street, Glasgow	do.
Villa, Higham Ferrers, Northants	.....	G. Hall, Architect, Higham Ferrers	do.
Two Houses, Hoyland Common, near Barnsley	.....	Wade & Turner, Architects, 10, Pitt-street, Barnsley	do.
Street Works	Salford Corporation	L. C. Evans, Town Hall, Plymouth	do.
Kerbing, &c.	Teddington R.D.C.	M. Hainsworth, Surveyor, Public Offices, Teddington	do.
Culvert, Workhouse-road	Wellingborough R.D.C.	J. T. Parker, 29, Church-street, Wellingborough	do.
Drainage Works, Abbey Lands, Elgin	.....	A. F. Macdonald, 150, High-street, Elgin	do.
Culvert, Whiterock-road	Belfast Corporation	City Surveyor, Town Hall, Belfast	do.
*Boundary Wall, Fencing, Lodge, Conservatory, &c.	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
*Erection of Police Station, Swanley	Kent County Council	County Surveyor, 86, Week-street, Maidstone	Feb. 18
Slag Road Metal	Huntingdon County Council	H. Leete, County Surveyor, Huntingdon	do.
Shop, &c., North-street, Keighley	.....	Moore & Crabtree, Architects, York Chambers, Keighley	do.
*Supply of Road Materials (Royal Parks)	Commissioners of H.M. Works, &c.	H.M. Office of Works, Storey's Gate, S.W.	do.
Electricity Buildings, Butts-road	Walsall Corporation	A. Wyllie, Borough Engineer, Town Hall, Walsall	do.
Granite Setts	Tamworth Corporation	F. E. G. Bradshaw, Borough Surveyor, 36, Aldergate, Tamworth	do.
Road Works	Watford U.D.C.	D. Waterhouse, Surveyor, Watford	do.
Road Works, Catherine-street	Eccles (Lancs) Corporation	T. S. Picton, Civil Engineer, Town Hall, Eccles	do.
Slag Road Metal	Headington (Oxon) R.D.C.	J. C. Coates, Surveyor, New Headington	do.
Police Station, Swanley, Kent	Kent County Council	County Surveyor, 86, Week-street, Maidstone	do.
Surveyor's Materials	Uckfield (Sussex) R.D.C.	F. Holman, 85, High-street, Lewes	do.
Sewage Disposal Works	Waltham Abbey U.D.C.	W. T. Steather, Surveyor, Highbridge-street, Waltham Abbey	do.
Mortuary Chapel, North Prospect	Devonport Town Council	J. F. Burns, Borough Surveyor, Ker-street, Devonport	do.
Additions to Steam Laundry, Workington	.....	C. W. Eaglesfield, Architect, Gordon-street, Workington	do.
Road Materials, &c.	Stoke-upon-Trent Corporation	A. Burton, Civil Engineer, Town Hall, Stoke-on-Trent	Feb. 19
Electricity Building, Stalybridge	.....	H. A. Matear, Architect, Dale-street, Liverpool	do.
Cast Iron Pipes	Stonehaven (N.B.) Town Council	G. Murdoch, Burgh Surveyor, Stonehaven	do.
Sewers, &c.	Norden (Lancs) U.D.C.	J. W. Sunderland, Surveyor, 10, Church-view, Norden	do.
Granite, &c. (5,980 tons)	Horncastle (Lincs) R.D.C.	J. E. Chatterton, Council Offices, Horncastle	do.
Additions to Schools, near Loughborough	East Leake (Leics) School Board	Barrowcliff & Allcock, Architects, Mill-street, Loughborough	do.
Sewers, &c., Ecclesfield, near Sheffield	Wortley R.D.C.	G. E. Beaumont, Civil Engineer, Grenoside, near Sheffield	do.
Street Works	Nelson (Lancs) Corporation	B. Ball, Civil Engineer, Town Hall, Nelson	do.
Disinfector Buildings, Reedyford	do.	do.	do.
Road Metal, &c., Hamilton, N.B.	Lanark County Council	A. Rankin, Road Surveyor, Airdrie, N.B.	do.
*Making-up of Roads	Ealing Town Council	Borough Engineer, Town Hall, Ealing, W.	do.
*Coal Offices &c. Child's Hill	Midland Railway Co.	Company's Architect, Cavendish House, Derby	do.
Sewers, &c.	Westhoughton (Lancs) U.D.C.	T. Partington, 117, Market-street, Westhoughton	Feb. 20
Sewers, &c. (Contract No. 5)	West Hartlepool Corporation	J. W. Brown, C.E.	do.
Granite Road Metal (2,000 tons)	Clare (Suffolk) R.D.C.	H. H. Pettett, Surveyor, Wash Farm, Hundon, Suffolk	do.
Street Works, Birch-grove, &c.	Levenshulme (Lancs) U.D.C.	J. Jepson, Surveyor, Tiviot Dale, Stockport	do.
Surveyor's Materials	Hardingstone (Northants) R.D.C.	J. Haviland, 2, St. Giles-square, Northampton	do.
Creamery, Donegal, Ireland	Co-operative Dairy Co.	J. Boyce, Main-street, Donegal	do.
House, Alresford, Hants.	.....	H. Y. Boreham, Architect, 75, Finsbury-pavement, London, E.C.	do.
Sewers, &c.	Westhoughton (Lancs) U.D.C.	T. Partington, 117, Market-street, Westhoughton	do.
Library	Buckley (Flints) U.D.C.	J. H. Davies & Sons, Architects, 14, Newgate-street, Chester	Feb. 21
House, &c., Pontarllawe	.....	D. J. Michael, Architect, 97, Oxford-street, Swansea	do.
Additions to Electric Light Station	Bexhill-on-Sea Corporation	Borough Surveyor, Town Hall, Bexhill	do.
Road Works, Shaw-street	Walsall Corporation	Borough Surveyor, Bridge-street, Walsall	do.
Seventy Houses, Wheatley Hill, Durham	Weardale Steel Co., Ltd.	Secretary, Colliery Offices, Thornley	do.
Road Metal	Nottingham County Council	E. P. Hooley, Shire Hall, Nottingham	do.
Chapel, Fair Green, Middleton, King's Lynn	.....	Jarvis & Sons, Architects, Paradise-parade, King's Lynn	do.
Road Metal	Belper R.D.C.	R. C. Duffield, Surveyor, Duffield, near Derby	Feb. 23
Macadam (7,000 tons)	Beverley R.D.C.	E. Picker, Civil Engineer, Beverley	do.
Gaswork Buildings, near Keighley	Silsden U.D.C.	J. Driver, Town Hall, Silsden	do.
Two Cottages, Ystradgynlais, Wales	.....	D. Thomas, Railway-terrace, Ystradgynlais	do.
Stone (6,000 tons)	Beverley (Yorks) U.D.C.	E. Picker, Civil Engineer, Beverley	do.
Road Works, Dundonald, N.B.	.....	J. Sturrock, Civil Engineer, King-street, Kilmarnock	do.
Sewer Pipes, &c.	Broadstairs (Kent) U.D.C.	H. Hurd, Civil Engineer, Broadstairs	do.
Cement, &c.	Deal Town Council	Borough Surveyor, Town Hall, Broadstairs	do.
Reservoir, Blackadon Asylum, Wrangaton, Devon	Asylum Committee	F. Hawarth, Surveyor, Municipal Buildings, Plymouth	do.
Hospital, &c.	Ticehurst (Sussex) R.D.C.	J. C. L. Andrews, Council Offices, Ticehurst	Feb. 24
Cast Iron Pipes	Stockton-on-Tees Corporation	W. Ford, Corporation Gasworks, Stockton-on-Tees	do.
Masonry Works for West Bridge	Northampton Corporation	A. Fidler, Civil Engineer, Town Hall, Northampton	do.
Sewerage Works, Moretonhampstead	Newton Abbot R.D.C.	G. D. Bellamy, Civil Engineer, 6A, Courtenay-street, Plymouth	do.
*Works of Sewerage and Sewage Disposal	Erpingham R.D.C.	Council's Engineer, Bank Buildings, Norwich	do.
*Execution of Works and Supply of Materials	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Sewerage Works, Grantchester	Chesterton R.D.C.	Waters & Worrall, 2, Sidney-street, Cambridge	Feb. 25
*Making-up Roads	Wood Green U.D.C.	Council's Surveyor, Town Hall, Wood Green	do.
*Supply of Road Materials (one or three years)	do.	do.	do.
*Rebuilding Pier House, Widening Pier, &c. Long Reach	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	do.
*Making-up Streets	Wanstead U.D.C.	Surveyor, Council's Offices, Wanstead, N.E.	do.
*Providing and Setting Kerbing	do.	do	do.
Lifeboat House, Polkerris, near Par, Cornwall	Royal National Lifeboat Inst.	W. T. Douglas, 13, Victoria-steet, S.W.	do.
Broken Granite, &c.	Tadcaster R.D.C.	T. Scott, Surveyor, Aberford, near Leeds	Feb. 26
*Wood Paving Works	Brighton Borough Council	Council's Surveyor, Town Hall, Brighton	Feb. 27
*New Electric Power Station	Sheffield Electric Light Committee	Engineer, Commercial-street, Sheffield	Feb. 28
*Annual Contracts	Borough of Paddington	Borough Surveyor's Office, Town Hall, Paddington, W.	do.
*Enlarging Buildings of Technical Institute, Norwood	London County Council	Hart & Waterhouse, 1, Verulam Buildings, W.C.	Mar. 2
Steel Rails (2,000 tons)	Glasgow Corporation	J. Young, 88, Renfield-street, Glasgow	do
*Additions, &c. to Public Washhouse, Camden Town	St. Pancras Borough Council	Council's Engineer, Town Hall, Pancras-road, N.W.	do.
*Underground Convenience, Blomfield-street	Corporation of London	The Engineer, Guildhall	Mar. 3
*New Sorting Office to Head Post Office, Bridgwater	Commissioners of H.M. Works, &c.	H.M. Office of Works, Storey's Gate, S.W.	do.
*Three New Blocks of Buildings, &c.	Chelsea Guardians	Landsell & Harrison, 65 and 66, Basinghall-street, E.C.	Mar. 4
*Well Sinking, &c.	East Cowes U.D.C.	W. Brown, Engineer, 709, High-road, Tottenham, N.	Mar. 6
Factory Buildings, Stockport	Vernon Spinning Co.	Potts, Son, & Hemmings, Archts., 34, Victoria-buildings, Manchester	No date
Granite, &c.	Alnwick U.D.C.	G. Wilson, Surveyor, Alnwick	do.
Mill, East Bergholt, near Colchester	.....	T. W. Carnie, 58, Bryanston-street, London, W.	do.
Schools, Braithwaite, Keswick	London County County	Oliver & Dodgshun, Architects, Carlisle	do.
*Supply of Materials for Works Department	Mr. R. G. Storey	Council's Works Department, Belvedere-road, S.E.	do.
Three Cottages, Allithwaite, nr. Grange-over-Sands	National School Managers	Settle & Farmer, Architects, County-square, Ulverston	do.
Rebuilding Retaining Wall, Kendal	Midsomer Norton U.D.C.	J. Stalker, Architect, Kendal	do.
Fence and Retaining Walls, Norton Hill	Colne (Lancs) Corporation	W. F. Bird, Surveyor, Market Hall, Midsomer Norton	do.
Surveyor's Materials (12 months)	War Office	T. H. Hartley, Borough Surveyor, Town Hall, Colne	do.
*Triennial Contracts		Commanding Royal Engineer	do.

[See also next page.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Ilford School Board	3*l.* 3*s.* per week	Feb. 20
*Quantity Surveyor for Works of Sewerage	Woodford U.D.C.	Not stated	Feb. 23

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. x. & viii. xxi. *Public Appointments*, xviii. & xix.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ALFRISTON (Sussex).—For three summer cottages for Mr. C. G. Champion. Mr. Bertram Earp, architect, Eastbourne :—

J. Vinall	£1,240 0	King & Son, Eastbourne*	£978 19
W. E. Noakes	1,005 0		

BANBURY.—For the supply of Hartshill stone for one year, for the Town Council. Mr. N. H. Dawson, C.E., Town Hall, Banbury :—

	Per ton. s. d.	
Tee's Hartshill Granite and Brick Co., Ltd., Hartshill, near Atherstone*	7 9	Block stone, hand picked.
Do.	7 3	Coarse chippings.
Do.	7 3	Fine chippings.
Do.	7 3	Granite dust.
Do.	9 3	1½-in. machine broken stone.

BARNSLEY.—For the erection of seven dwelling-houses and outworks in Grafton-street, Barnsley. Messrs. Wade & Turner, architects, 10, Pitt-street, Barnsley. Quantities by the architects :—

Building.—Alfred Smart, 11, Leopold-street, Barnsley*	£948 10 0
Joinery.—J. Thornley, Shambles-street, Barnsley*	305 0 0
Plumbing and Glazing.—F. W. Rogers, Barnsley*	49 0 0
Slating.—M. Fleming, Barnsley	78 10 0
Plastering.—J. Shaw, Barnsley*	99 0 0
Painting.—C. Whitwell, Barnsley*	25 17 6

BOLTON-LE-SANDS.—For additions to Hawksteads, for Mr. H. J. Coulston. Mr. J. Parkinson, architect, 67, Church-street, Lancaster. Quantities by architect :—

Masonry.—R. B. Wilson, Bolton-le-Sands *Joinery.*—T. Pearson, Bolton-le-Sands *Slating and Plastering.*—Hall & Son, Lancaster *Plumbing.*—Calvert & Heald, Lancaster *Painting.*—H. Warbrick, Lancaster	£1,078 4

BRENTFORD.—For making-up Lamb-passage, for the Urban District Council. Mr. Nowell Parr, Surveyor, Clifden House, Boston-road, Brentford :—

Ball & Co.	£149 0 0	W. Parker	£131 9 8
Mowlem & Co.	140 0 0	Peters & Co.	126 8 0
R. D. Daniel	139 10 0	Nowell & Co., Warwick-road, Kensington*	119 0 0
W. Swaker	131 15 0		

BRISTOL.—For the erection of a group of homes, hall, &c., Downend, for the Guardians. Messrs. La Trobe & Western, architects, 20, Clare-street, Bristol :—

Browning	£20,438	Stephens, Baston, & Co., Ltd.	£18,987
Beaven	20,280	R. F. Ridd	18,763
Wilkins & Son	19,439	E. Clark	18,740
A. E. Longden	19,411	Downs & Son*	17,600

[All of Bristol].

BURGH-BY-AYLSHAM (Norfolk).—For the restoration of the nave, &c., at St. Mary's Church, Burgh, for the rector and churchwardens. Mr. John B. Pearce, architect, 15, Upper King-street, Norwich. Quantities by architect :—

J. Holmes	£816 0 0	G. Hawes	£622 0 0
J. Tuddenham	808 13 7	Scarles Bros.	598 10 0
R. Morriss	692 15 6	R. Watts	555 13 4
W. Porter	675 17 9	W. Larner	544 17 1
W. & H. Wade	659 11 2	F. & S. Smith	535 0 0
R. Chapman	647 0 0	T. H. Blyth, Foulsham*	509 0 0
H. Greengrass	624 0 0		

BURTON LATIMER (Northants).—For sinking a well, &c., for the Kettering Rural District Council. Mr. J. B. Everard, C.E., 6, Millstone-lane, Leicester :—

Timmins & Sons, Ltd.	£3,732 7 2	Bentley & Loch	£1,824 11 0
J. H. Dawson	2,516 9 0	C. Chamberlain, Leicester*	1,650 3 0
Siddons & Freeman	2,416 0 0		

CARDIFF.—For the construction of two masonry bridges, Cathays Park and North-road, for the Corporation. Mr. W. Harpur, C.E., Town Hall, Cardiff. Quantities by Engineer, Town Hall, Cardiff :—

	Bridge No. 1.	Bridge No. 2.
Williams & Hoare	£5,042 14 9	£1,669 5 9
Frank Ashley	4,934 3 6	1,659 13 9
A. W. Cadwallader	4,873 13 6	1,676 6 5
Lattey & Co., Ltd.	4,763 18 9	1,592 0 0
Allan & Son	4,705 9 9	1,676 7 7
Turner & Sons	4,305 10 5	1,481 3 3*
Chas. Davies	*4,035 11 9	1,499 0 10

[All of Cardiff.]

CASTLEFORD.—For the improvement of Duke-street, for the Urban District Council. Mr. W. Green, surveyor, Carlton-street, Castleford :—
Jonas L. Rodger, Albion-street, Castleford* £1,055

CASTLEFORD.—For relaying causeway, Carlton-street, for the Urban District Council. Mr. W. Green, surveyor, Carlton-street, Castleford :—
Geo. Dyson, Rochdale* £320

DIDCOT.—For additions and alterations to the Board School at Didcot, for the Didcot School Board. Messrs. Hoare & Wheeler, architects, Reading and London. Quantities by Messrs. H. Cooper & Sons, Reading :—

Stokes & Son	£1,178 0	J. Colborne	£912 17
J. Smallbone	970 0	Bosher & Son, Cholsey*	850 0
H. Bowden	949 6		
G. King	944 12		

DOWNPATRICK (Ireland).—For alterations at workhouse infirmary, for the Guardians :—

William Neill	£192	James Dickson, Cromac-street, Belfast*	£168
R. J. McDonald	190		

DUBLIN.—For the erection of a public library, Lower Kevin-street, for the Public Libraries Committee, Corporation of Dublin. Mr. C. J. MacCarthy, City Architect, City Hall, Dublin. Quantities by Mr. J. Mackey :—

Foley & Son	£4,886 3 4	J. Pemberton	£4,321 10 0
Somers & Son	4,613 3 8	McGloughlin & Harvey	4,275 0 0
James P. Pill	4,440 0 0	Alexander Hull & Co.	4,150 0 0
H. J. Monks	4,440 0 0	Jas. Donovan	4,099 0 0
J. Hemingway	4,387 14 7	Thos. Mackey, Camden-st.*	3,988 0 0
Conolly & Son	4,330 0 0		
Pemberton & Son	4,326 0 0		

ILKESTONE.—For the erection of a public library for the Corporation. Messrs. Hunter & Woodhouse, architects, Belper. Quantities by architects :—

Perks & Sons	£7,644	A. Earnshaw	£6,840
Pegg & Bailey	7,608	Williamson & Co.	6,799
Walker & Slater	7,400	Ford & Co.	6,782
A. E. Smith	7,248	A. Summerfield	6,770
Smith & Sons	7,133	J. G. Thomas	6,733
Donnelly & Sons	7,044	J. & J. Warner	6,551
W. V. Ireson	7,025	Wheeldon Bros.	6,490
Herbert & Sons	6,945	Vickers & Sons	6,420
Wagg & Sons	6,918	Cooper & Sons, Ltd.	6,350
Moss & Sons, Ltd.	6,890	T. Barlow, Nottingham*	6,310
Park & Thorpe	6,846		

IPSWICH.—For additions to St. John's Home, for the Guardians. Mr. H. J. Wright, architect, 4, Museum-street, Ipswich. Quantities not provided :—

C. A. Green	£186 0 0	M. Death	£153 0 0
Cooper & Haward	165 10 0	W. H. Death	144 0 0
H. Skerritt	157 10 8	W. H. Bloomfield	140 0 0
T. Frost	155 0 0	G. Thwaites	134 0 0
V. A. Marriott	155 0 0	E Scott	129 10 0
R. G. Seaman	154 10 0	Stearn & Co.*	120 10 0

[All of Ipswich.]

KIRKCALDY.—For causewaying works for the Town Council :—
W. Dobson, Edinburgh*..... £1,317 5 4

KNARESBOROUGH.—For the execution of main sewerage-works, Killinghall, for the Knaresborough Rural District Council. Mr. R. Annakin, Surveyor, 44, Station-parade, Harrogate :—

Dickinson	£1,796	Exors. late W. Annakin	£1,438
T. Godfrey	1,640	J. Frost	1,425
J. Buckley	1,476	B. Oxley	1,239
G. Parsons	1,455	J. L. Matthews, Harrogate*	1,110
J. Thompson	1,452		

LITTLEHAMPTON.—For paving works, &c., Dorset-road, for the Urban District Council. Mr. H. Howard, Surveyor, Town Offices, Littlehampton :—

H. A. Chambers	£432 13 6	W. Wallis	£340 0 0
E. H. King	432 0 0	E. G. Holland, Littlehampton*	335 0 0
Grounds & Newton	359 0 0		

LONDON.—For paving, &c., Roach-road, Bow, for the Poplar Borough Council. Mr. Harley Heckford, Borough Surveyor :—

W. Peters & Co.	£886 13 11
Geo. G. Anderson, North-street, Poplar, E.*	830 0 0

LONDON.—For the supply of cockle shell required for use at parks and gardens for the London County Council :—

—	Mr. Gibbs.	Messrs. Tuff & Miskin*	Messrs. Shelbourne & Co.	Mr. Sommerfeld.
	per cubic yard. s. d.	per cubic yard. s. d.	per cubic yard. s. d.	per cubic yard. s. d.
Battersea Park	6 0	6 4	7 0	9 3
Brockwell Park	7 6		10 0	9 3
Deptford Park	7 6	10 0	9 0	8 0
Hilly Fields	9 0		10 0	8 0
Maryon Park	9 0		13 0	8 0
Royal Victoria Gardens	5 6	9 5	13 0	8 0
Peckham Rye	7 6	8 3	10 0	8 0
Southwark Park	7 6	9 7	9 0	8 0
Lincoln's Inn Fields	8 0		12 0	8 0
Victoria Embankment Gardens	8 0	9 2	12 0	8 0
Clissold Park	8 6		18 0	8 0
Victoria Park	5 9		8 0	9 3
Wandsworth Park	6 6	7 8	9 0	9 0

* Messrs. Tuff & Miskin do not tender for whole cockle shell. Their prices are for shell containing fine sand and shingle.

[Mr. W. Gibbs accepted as regards Battersea Park, Brockwell Park, Deptford Park, Royal Victoria Gardens, Peckham Rye and Park, Southwark Park, Lincoln's Inn Fields, Victoria Park, and Wandsworth Park; and Mr. L. Sommerfeld accepted as regards Hilly Fields, Maryon Park, Victoria Embankment Gardens, and Clissold Park.]

LONDON.—For alterations and additions to the United Friends b.-h., Wellington-street, Deptford, for Mr. C. Conlay. Mr. John Jas. Downes, architect, 199, Lewisham High-road, S.E. :—

W. Martin	£1,460	W. O. Collingwood, Brockley*	£1,140
Hall Bros.	1,390		
S. R. Best	1,285		

LONDON.—For the erection of Darcy-buildings, London Fields, for the accommodation of persons to be displaced by the carrying into effect of the Mare-street improvement, Hackney, for the London County Council :—

	£	Including alternative estimates for certain works. £ s. d.
C. Dearing & Sons	10,610	10,702 13 2
B. E. Nightingale	10,022	10,094 5 10
Martin, Wells, & Co.	9,442	9,507 4 7
Marsland & Sons	9,428	9,495 2 6
A. E. Symes	9,230	9,270 1 6
H. L. Holloway	9,200	9,253 7 8
Stimpson & Co.	9,240	9,208 0 0

[The architect's estimate, including alternative estimates for the works referred to, amounted to £8,912.]

LONDON.—For erecting bakery, shop, and flat, Nos. 106 and 110, Brompton-road, S.W., for Messrs. Spiking & Co. Messrs. Blangy & Van Baars, architects, 19, Old-square, Lincoln's-Inn, W.C. :—

	Estimate A.	Estimate B.
T. Boyce	£8,783	—
Leslie & Co.	6,540	£38
Lole & Lightfoot	6,144	75
Syme & Duncan	5,925	150
Langdale, Hallett, & Co.	5,485	220
Turtle & Appleton*	4,920	55

For Building Twelve Ovens.

T. Smith & Sons £1,009 15

LONDON.—For fencing work, Totterdown-fields Estate, Tooting, for the London County Council :—
Mr. R. Mulford* £232 2

LONDON.—For the construction of a timber jetty, Cheyne-walk, for the Chelsea Borough Council. Mr. T. W. Higgens, C.E., Borough Surveyor, Town Hall, King's-road, Chelsea :—

G. Webb	£1,510 6 11	Shelbourne & Co.	£965 0 0
Facey	1,315 0 0	Grice	933 0 0
Chafen	1,298 0 0	London & Tilbury Lighterage Co.	910 0 0
Reader	1,289 0 0	Munday & Sons, Catharine House, Trinity-square, E.C.*	874 0
Woodhouse	1,231 13 2		
Cochrane	1,100 0 0		
Leggatt	1,079 0 0		
Colwell & Halze	1,010 10 0		
C. Wall	975 0 0		

[*See also next page*

MIDDLETON (Lancs.)—For the erection of a post office and offices, Long and Sadler-streets. Messrs. Stones & Stones, architects, 10, Richmond-terrace, Blackburn. Quantities by architects :—

W. A. Peters & Sons, Crossfield, Rochdale* £3,268

MUNDESLEY-ON-SEA.—For cottage residence, Messrs. Clare & Ross, architects, Chelmsford and London :—

Cornish & Gaymer	£883 12	J. S. Smith, Norwich*	£630 0
Wilkins & Randall	727 0		

NAAS (Ireland).—For the erection of a house, dispensary, &c., Blessington, for the Guardians of Naas Union. Mr. Francis Bergin, architect, Kildare. Quantities by architect :—

H. J. Mond	£1,600 0	J. Taylor, Brannoxtown, Kilcullen*	£1,185 10
Kennedy	1,600 0		
Joan Jennings	1,200 0		

PENTRE (Glam.).—For additions to chapel, for the Building Committee. Mr. W. D. Morgan, architect, Victoria Chambers, Pentre :—

Alban Richards, Pentre, Glam.* £560

PORTSLADE (Brighton).—For the erection of new schools. Mr. E. A. Lingen Barker, architect, Hereford :—

Drake	£2,050 0 0	Sattin & Evershed	£1,727 0 0
Huntley & Beck	1,979 0 0	Nash & Nash	1,695 4 0
Holland	1,904 10 6	Wells	1,693 0 3
Cook & Sons	1,850 0 0	Gann & Co.	1,677 0 0
Hackman & Co.	1,825 0 0	Field & Co.	1,652 0 0
Rowland Bros.	1,799 0 0	Smith & Sons	1,623 0 0
Longley & Co.	1,749 0 0	Eastwood, Market Harboro'*	1,618 0 0

ST. ALBANS.—For the erection of a stable and coach-house, for the Visiting Committee of the Hill End Asylum. Mr. G. T. Hine, architect, 35, Parliament-street, S.W. :—

King, Son, & Halford	£1,050 0 0	G. Wiggs	£927 0 0
Townsend & Coles	971 11 6	E. Dunham	925 0 0
Goodchild & Jeffery	966 0 0	J. T. Bushell	911 7 0
Willmott & Sons	962 0 0	Miskin & Sons	910 0 0
S. Worboys	935 0 0	Newton	871 0 0
		J. Naden	862 17 5
		W. H. Hinkins, High-st., Royston, Herts.*	792 0 0

SUNDERLAND.—For the erection of a Congregational Church, Roker Baths-road, Monkswearmouth. Messrs. Jos. Potts & Sons, architect, 57, John-street, Sunderland. Quantities by architects :—

Tiffin	£7,574 0 0	W. B. Cooper	£5,469 0 0
Ranken	6,998 0 0	J. B. Stott, Sunderland†	5,449 19 4
Armitage	6,428 0 0	Taylor & Welford	5,446 0 0
White	6,325 0 0		
Shaftoe	5,959 0 0		
Robertson & Sons	5,774 18 0		

WINCHESTER.—For the erection of a house, St. Cross, for Mr. J. C. Lyell. Messrs. Colson, Farrow, & Nisbett, architects, 45, Jewry-street, Winchester. Quantities by architects :—

Chinchen	£3,604 7 10	Bascomb	£2,829 0 0
Avery	3,375 0 0	Scammel	2,700 0 0
White	3,100 0 0	Golding & Ansell	2,620 0 0
Franklin	3,050 0 0	Coston & Co., Southampton*	2,586 0 0
Rashley	2,943 0 0		
Jenkins	2,934 0 0		
Stevens	2,924 0 0		

WOKING.—For gardener's cottage, St. Peter's Home. Messrs. Clare & Ross, architects, 1, West-street, Finsbury Circus, E.C., and Chelmsford. Quantities by the architects :—

W. & C. Brown	£580	Martin Wells & Co., Ltd.	£493
R. Pain	512	Harris & Son, Woking*	485

WORCESTER.—(A) For pulling down and rebuilding Nos. 55-58, High-street, and (B) forming new arcade, &c., from St. Swithin-street to Church-street, for Messrs. Woodward. Messrs. Clare & Ross, architects, 1, West-street, Finsbury-circus, E.C., and Chelmsford. Quantities by Mr. H. M. Messenger, 16, Great George-street, Westminster, S.W. :—

	A	B
Thos. Vale	£8,279	£4,763
Collins & Godfrey	8,273	4,440
Stokes Bros.	8,135	4,679
Wood & Sons	7,890	4,527
F. J. Briley	7,470	4,570
Bromage & Evans	7,420	4,190
J. & A. Brazier	7,380	4,060
Barnsley & Sons	7,188	4,200
W. Hopkins, Birmingham†	6,900	4,100

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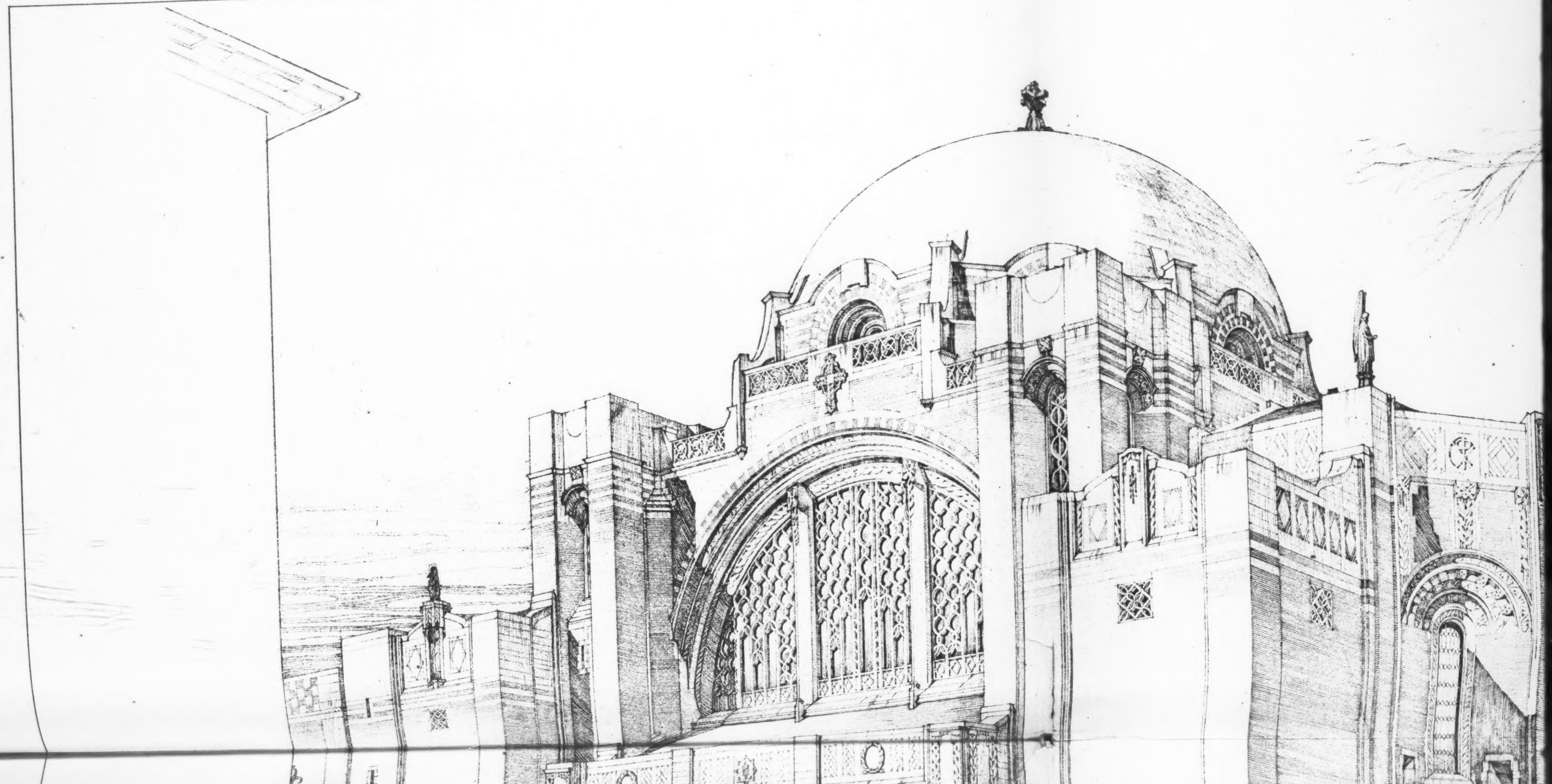
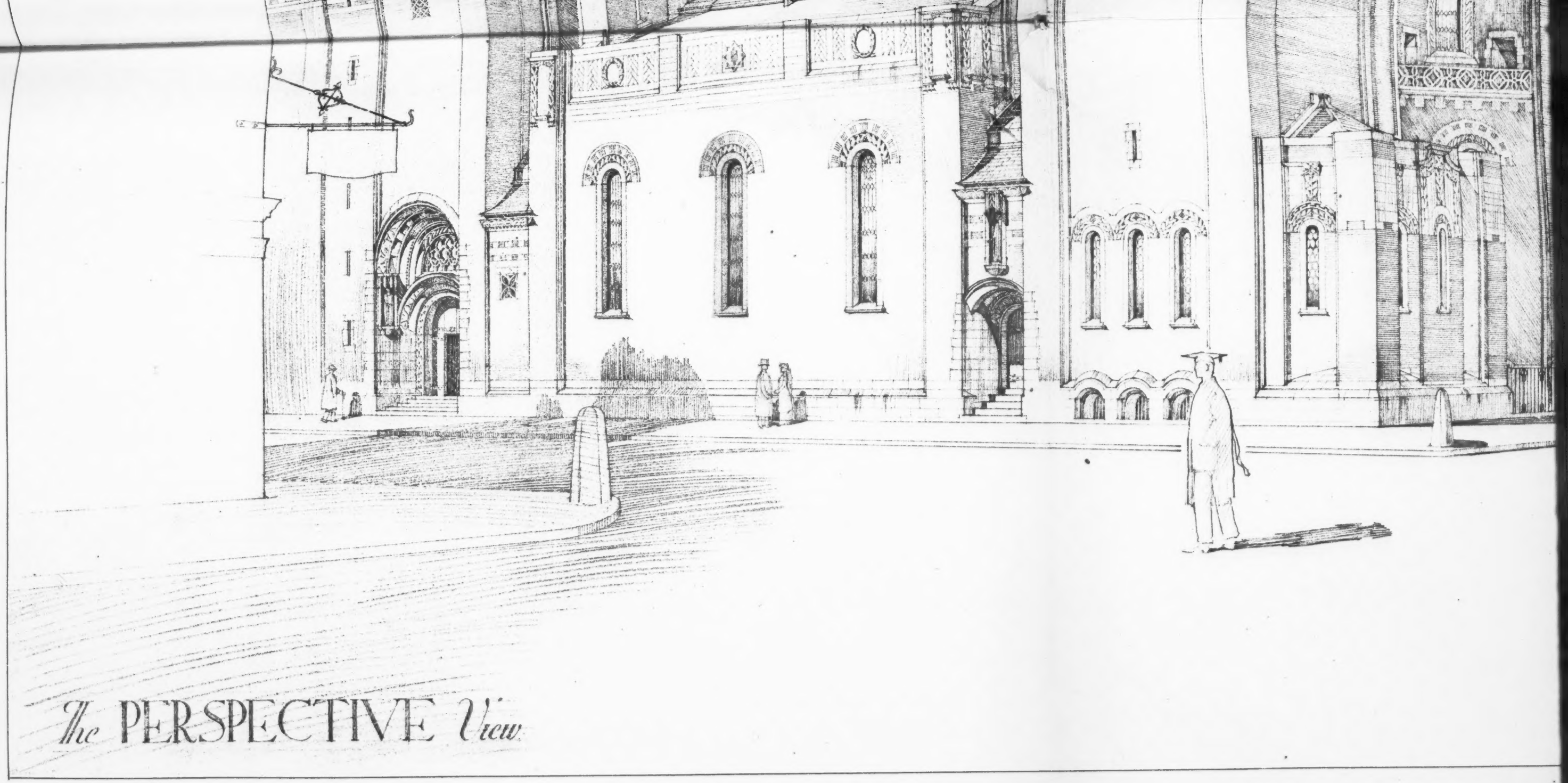
LIVERPOOL: 6 and 8, HATTON GARDEN.
GLASGOW: 47 and 49, ST. ENOCH-SQUARE.
BRISTOL: ASHTON GATE WORKS, CORONATION-RD.





The PERSPECTIVE *View*

Soane Medallion, R.I.B.A., 1903.

DESIGN FOR A TOWN CHURCH.—By Mr. E. F. Reynolds.

PERSPECTIVE VIEW.

"INK-PHOTO" SPRAGUE & Co. Ltd. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

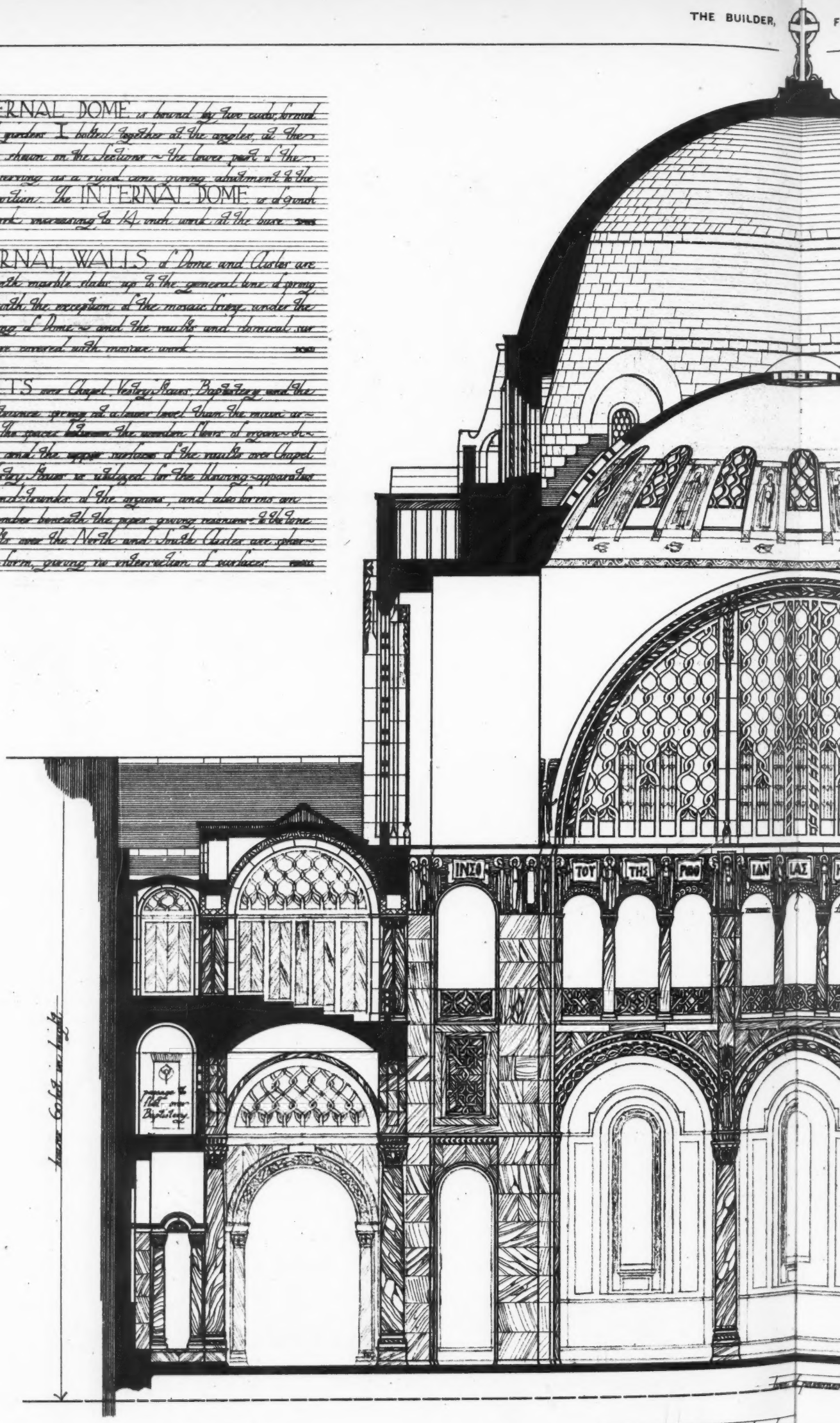
DESIGN FOR A TOWN CHURCH.—By Mr. E. F. Reynolds.

PERSPECTIVE VIEW.

The EXTERNAL DOME is formed of two outer forms of steel girders I bolted together at the angles, at the heights shown on the sections. The lower part of the dome serving as a rigid cone giving abutment to the upper portion. The INTERNAL DOME is of brickwork measuring 9 in. each way at the base.

The INTERNAL WALLS of Dome and Cloister are lined with marble slabs up to the general line of springing, with the exception of the mosaic frieze under the impannage of Dome, and the marble and chemical surfaces are covered with mosaic work.

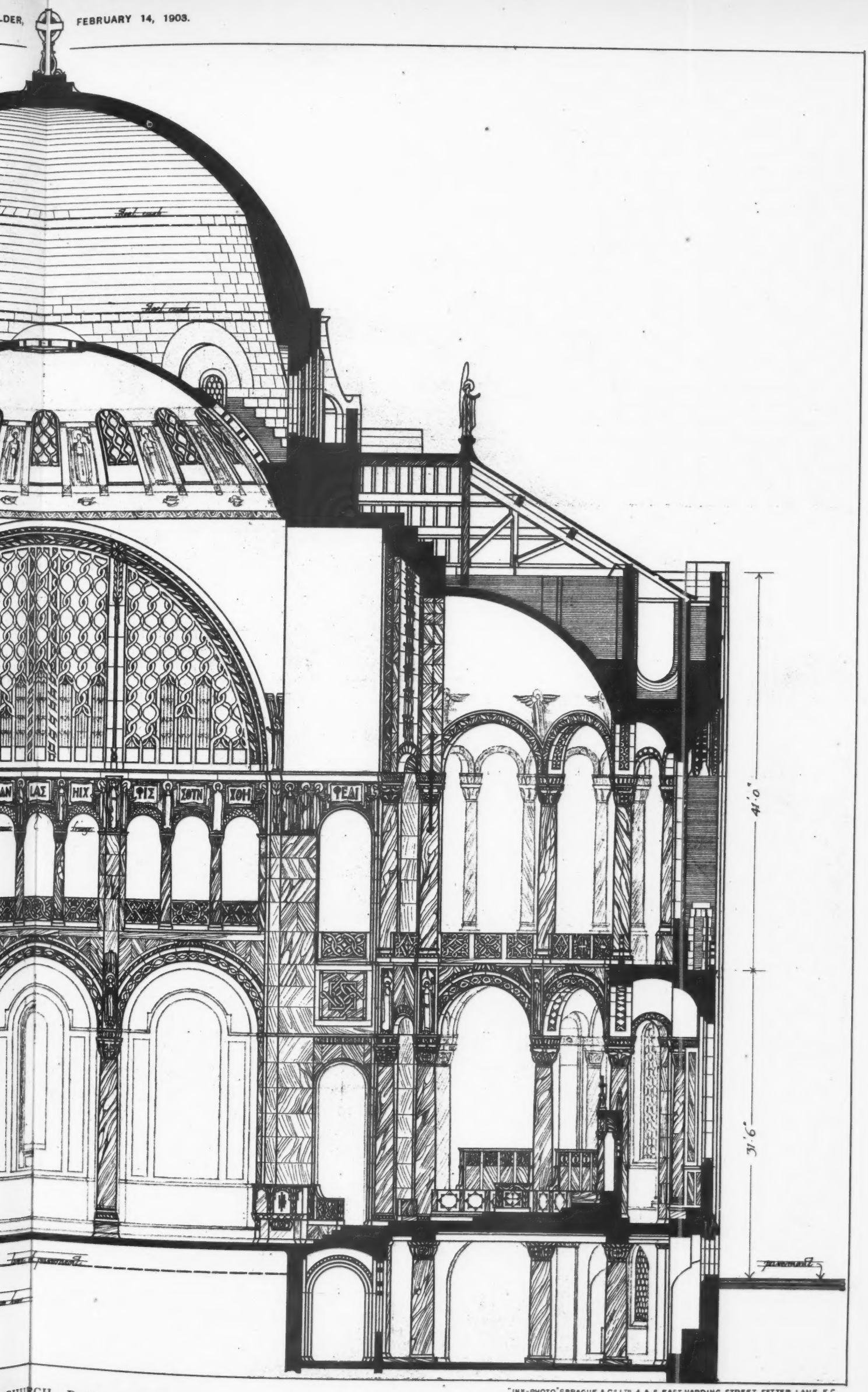
The VAULTS over Chapel, Vestry, Stairs, Baptistery and the West Entrance spring at a lower level than the main arcades. The spaces between the wooden floors of upper cloisters and the upper surfaces of the vaults over Chapel and Vestry Stairs is utilized for the blowing apparatus and ventilating of the organs, and also forms one air-chamber beneath the roof, giving resonance to the tone. The vaults over the North and South Cloister are plain tunnel vaults, giving no intersections of surfaces.



Soane Medallion, R. I. B. A., 1903.

DESIGN FOR A TOWN CHURCH.—I

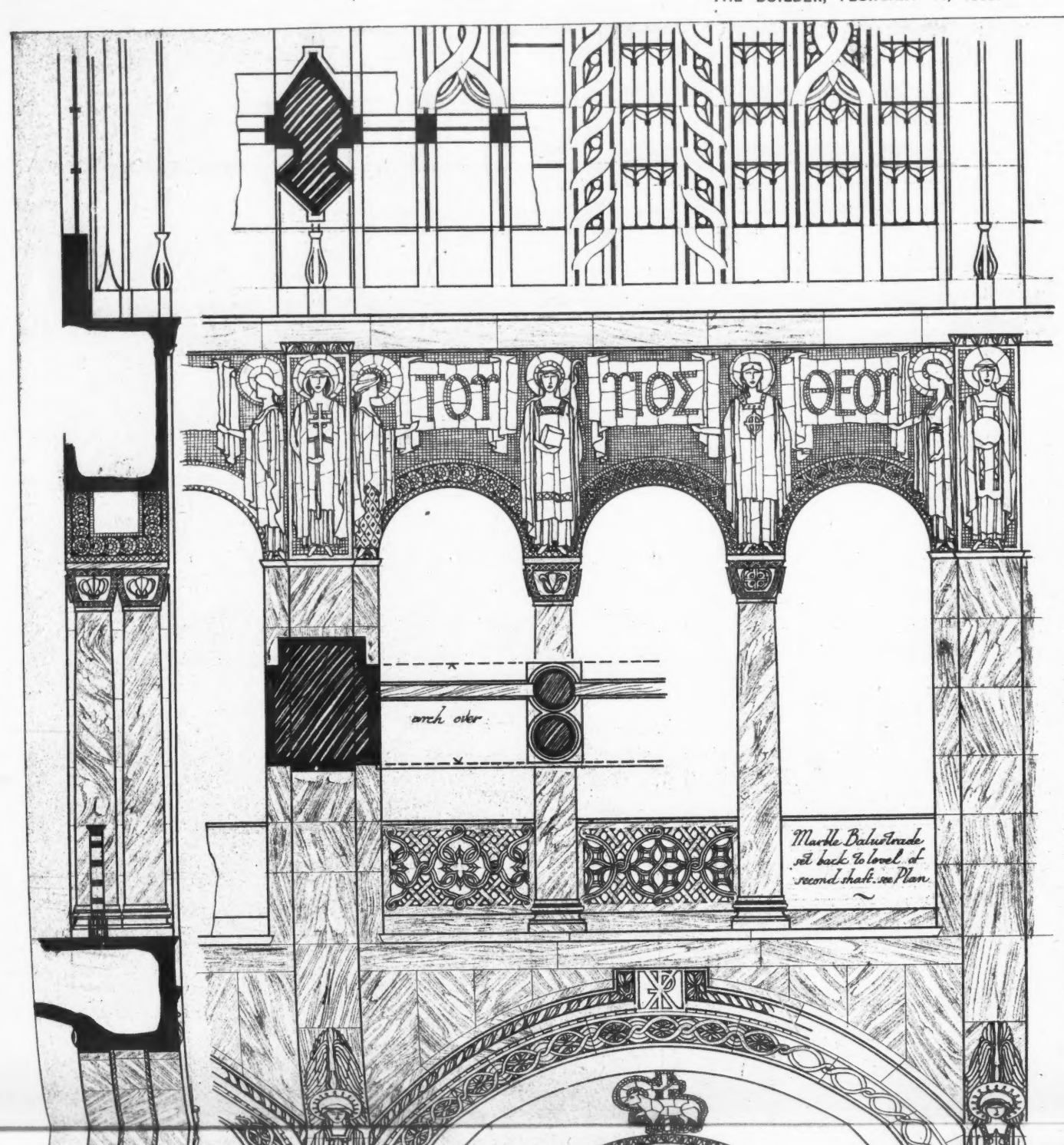
SECTION.



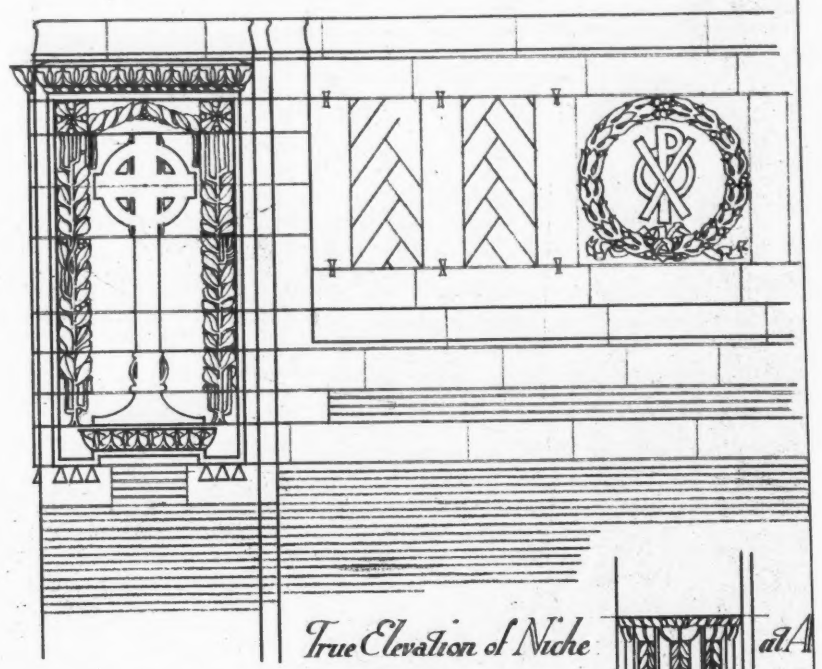
CHURCH.—By Mr. E. F. Reynolds.

SECTION.

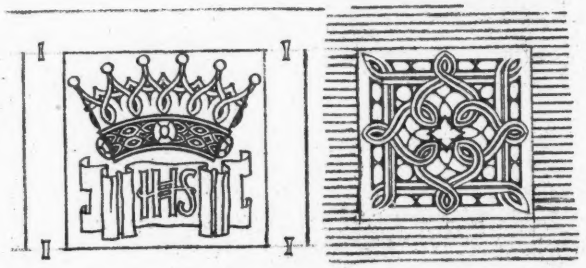
"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



Elevation of PARAPET to South Aisle.



True Elevation of Niche at A



Panel over East End ~ Windows & Gables. &c

Plan of ENTRANCE Door

Plan at Lower Springing

Section & Elevation of CENTRAL BAY of Arcade under Dome.

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DESIGN FOR A TOWN CHURCH.—By Mr. E. F. Reynolds.

DETAILS.

Soane Medallion, R.I.B.A., 1903.